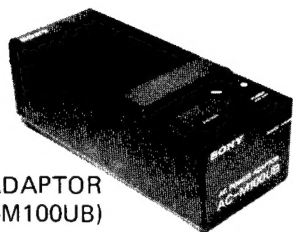


BMC-100P/100PK

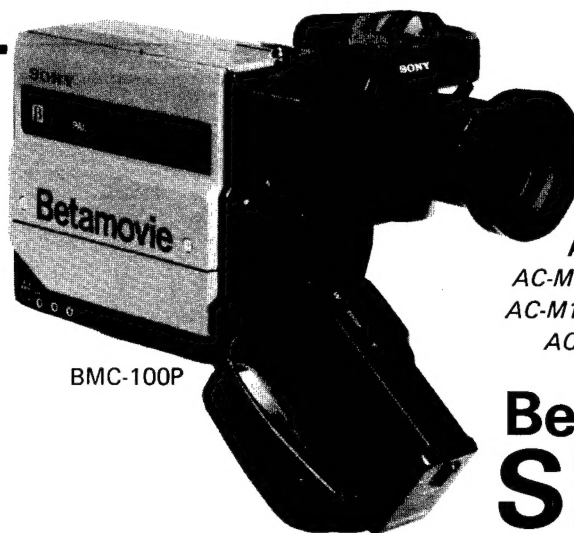
AC POWER ADAPTOR

SERVICE MANUAL

AEP Model
UK Model
E Model
 (See page 2)



AC POWER ADAPTOR
 (AC-M100UB)



BMC-100P

AC POWER ADAPTOR
 AC-M100E (AEP Model) Optional
 AC-M100UB (UK Model) Supplied
 AC-M110E (E Model) Supplied

Betamovie
SB CHASSIS

November, 1983

Refer to separate adjustment manual,
 Part number 9-972-284-81.

SPECIFICATIONS

System

Video recording system

Rotary double-azimuth single-head,
 Helical scanning
 Usable cassettes Cassettes having the mark **B**
 Tape speed 18.73 mm/sec.
 Maximum recording time 3 hours 35 min.
 (with L-830 video cassette)

Audio frequency response

50-8,000 Hz
 (using an external microphone)
 Pickup tube 1/2-inch SMF Tricon tube
 Lens Combined 6x power zoom lens
 f9 mm (F1.2)-54 mm (F1.4)
 with macro
 Filter diameter: 52 mm

Colour temperature selector

Built-in 2-step filter
 (3200°K/5500°K)

Minimum illumination

28 lux

Illumination range

28 lux to 100,000 lux (2.6 to 9294 footcandles), automatic sensitivity and iris

Inputs and outputs

DC IN 9.6 V jack 9.6 V dc
 EARPHONE jack Minijack, -26 dBs, 8-ohm impedance
 REMOTE jack Minijack
 MIC jack Minijack, -65 dBs, Low impedance

General

Power requirements

9.6 V dc

Power consumption 9.0 W

Operating temperature

0°C to 40°C (32°F to 104°F)

Dimensions

Approx. 125 × 220 × 357 mm
 (w/h/d)
 (5 × 8 3/4 × 14 1/8 inches)
 when packed

Weight

2.5 kg (5 lb 8 oz) Betamovie only

Viewfinder

TTL optical system,
 Eyesight correction adjustable
 (+2 - -4 DP)

Microphone

Built-in electret condenser mic

Accessories supplied

Eye cup cover...1
 Shoulder strap...1
 Earphone...1
 Decal...1
 Battery pack NP-11...1 (UK, E Model)
 AC Power adaptor AC-M100UB...1 (UK Model)
 AC-M110E...1 (E Model)



Beta
B BETAMOVIE
SONY®

BMC-100PAEP MODEL
AC POWER ADAPTOR and BATTERY PACK (optional)
BMC-100PKUK, E MODEL
AC POWER ADAPTOR and BATTERY PACK (supplied)

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING !!


COMPONENTS IDENTIFIED BY SHADING AND MARK  ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

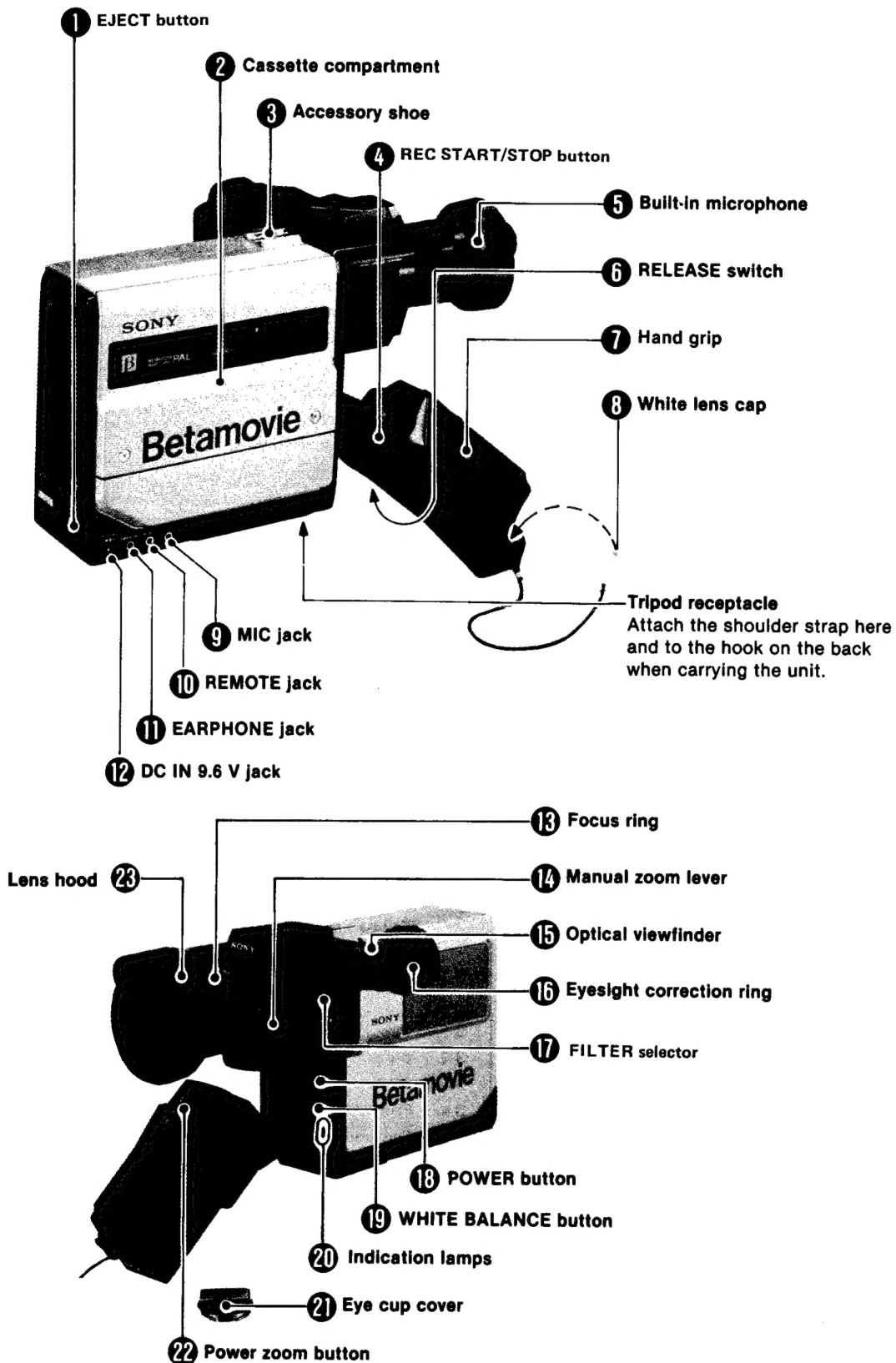
TABLE OF CONTENTS

[illegible]

SECTION 1

OUTLINE

1-1. LOCATION AND FUNCTION OF PARTS AND CONTROLS



- ① **EJECT button**
Slide down to open the cassette compartment. (p. 9)
The button does not operate when the power is not supplied or the battery power is exhausted.
- ② **Cassette compartment**
Insert the cassette here. (p. 6)
If a cassette is not loaded, no function except the EJECT button will work.
- ③ **Accessory shoe**
For attachment of an external microphone (with a SAD-100 external microphone shoe).
- ④ **REC START/STOP button**
Press to start recording, press again to stop. (p. 8)
- ⑤ **Built-in microphone**
Sound is recorded simultaneously with video taping.
- ⑥ **RELEASE switch**
Slide to unlock the hand grip. Hand grip angle can be set in one of three positions. (p. 7)
- ⑦ **Hand grip**
Comfortable grip that also holds the battery pack. (p. 6)
- ⑧ **White lens cap**
Snap onto the hand grip belt when shooting. Place on the lens hood when the unit is not in use, or to adjust the white balance.
- ⑨ **MIC jack**
For connection of an external microphone. The built-in microphone is automatically disconnected.
- ⑩ **REMOTE jack**
For connection of an optional Betamovie Commander to control the unit from a distance.
- ⑪ **EARPHONE jack**
For connection of the supplied earphone to monitor the sound being recorded. (p. 8)
- ⑫ **DC IN 9.6 V jack**
For connection of an ac power adaptor or car battery cord. The internal battery power is automatically disconnected.
- ⑬ **Focus ring**
Turn the ring to focus while looking through the viewfinder. (p. 12, 15)
- ⑭ **Manual zoom lever**
Use the zoom lever to turn the zoom ring manually between W(wide-angle) and T(telephoto) positions.
For close-ups, turn the knob of the lever in the direction of arrow, then turn the lever counter-clockwise until the ring is in the MACRO position.
- ⑮ **Optical viewfinder**
Place your right eye here so that the lens' full field of view can be seen.

It is possible to focus the lens with the power off. The letter lamps inside the viewfinder indicate all the information necessary for operation.

W: Lights steady when the white balance needs adjustment. (p. 10, 11)
Blinks during adjustment.

T: same as the **TAPE/BATT** indication lamp. (item ⑳)

C: same as the **CAUTION** indication lamp. (item ㉑).

L: Lights when the light level is too low. (p. 10)

⑯ **Eyesight correction ring**

Adjust to your eyesight to assure good focus. (p. 12)

Be sure to adjust when shooting for the first time.

⑰ **FILTER selector**

Set to the proper position in accordance with prevailing light conditions. (p. 10)

☀: Sunlight (outdoors or indoors)

💡: Incandescent lamps, fluorescent lamps or photo-flood lamps (indoors)

⑱ **POWER button**

Press to adjust the white balance or to set the standby mode for immediate recording starts. (p. 9) The **STANDBY** lamp will light. Press again and the lamp goes off.

⑲ **WHITE BALANCE button**

Press to adjust the white balance with the white lens cap on, after setting the **FILTER** selector. (p. 10, 11)

⑳ **Indication lamps**

TAPE/BATT: Lights steady when the tape is running.

Blinks when the battery is exhausted. Replace the battery pack.

DEW: Lights when moisture has condensed inside the unit. Eject the cassette and let the Betamovie sit until the moisture evaporates. The unit can be used again if the light does not come on when the cassette is reinserted.

CAUTION: Blinks when the video head becomes clogged or dirty. Clean the video head with a Sony L-25CL video head cleaning cassette.

Lights steady when the unit is out of order. Contact the nearest Sony dealer or local Sony service facility.

㉑ **Eye cup cover**

Attach to the viewfinder eye cup when remotely controlling the unit.

Attach to the shoulder strap when not in use.

㉒ **Power zoom button**

Press for smooth power zooming between the W(wide-angle) and T(telephoto) positions.

㉓ **Lens hood**

Usually attached to the Betamovie. Remove when shooting close-ups or using an optional filter. (p. 13)

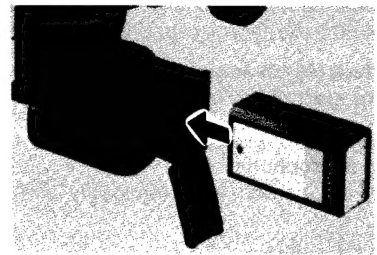
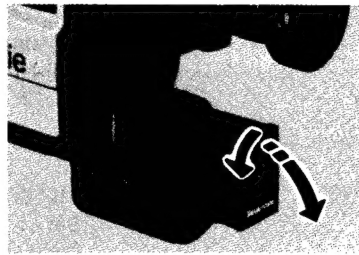
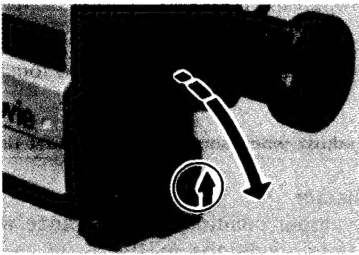
1-2. RECORDING

Operation is easy and practice shooting will help you to become familiar with the procedures.

Preparations

1 Install a charged battery pack, NP-11.

- 1 Slide the **RELEASE** switch up to bring down the hand grip.
- 2 Turn the **BATTERY** knob to **OPEN**, and open the lid.
- 3 Insert a battery, close the lid and turn the knob to **CLOSE**.



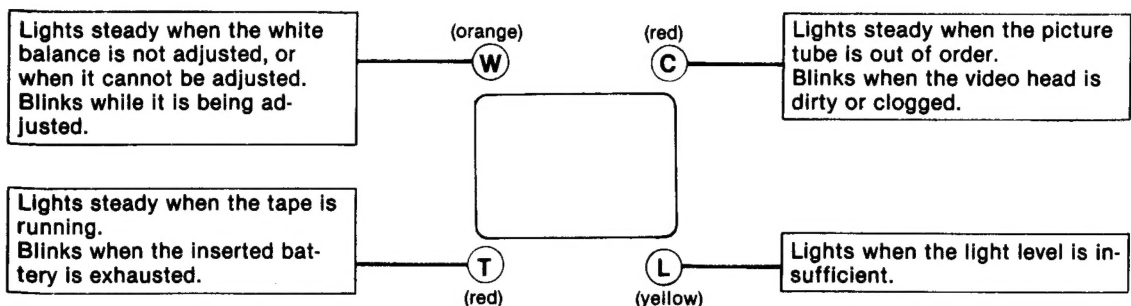
2 Install a cassette (with the safety tab).

- 1 Slide the **EJECT** button down to pop up the compartment lid.
- 2 Insert a cassette with the round window to the right and push down to settle.
- 3 Press the left side of the compartment lid to close.



The letter lamps inside the viewfinder

The lamps blink or light steady to indicate all the information necessary for operation.



All the lamps light up at first when the **POWER** or **REC START/STOP** button is pressed.

Operation

Betamovie is only for recording.
For tape duplication, two other VCRs are required.

1 Set to the standby mode.



2 Adjust the white balance.

With the white lens cap on



- 1 Set the **FILTER** selector according to the prevailing light condition.

The "W" goes off when adjusted.
In the viewfinder



Sunlight (outdoors or indoors)

Artificial lights (indoors)

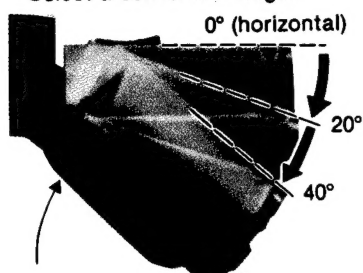
When you press the **WHITE BALANCE** button immediately after pressing the **POWER** button, the white balance may sometimes not adjust. In that case, press the **WHITE BALANCE** button again.

Get ready for shooting

- 1 Lock the hand grip into a position.

Hand grip

Select a convenient angle.



- 1 Slide the **RELEASE** switch to unlock and bend.
- 2 Release to lock at the desired angle.

- 2 Place your right hand under the grip belt and grasp the grip.

Grip belt

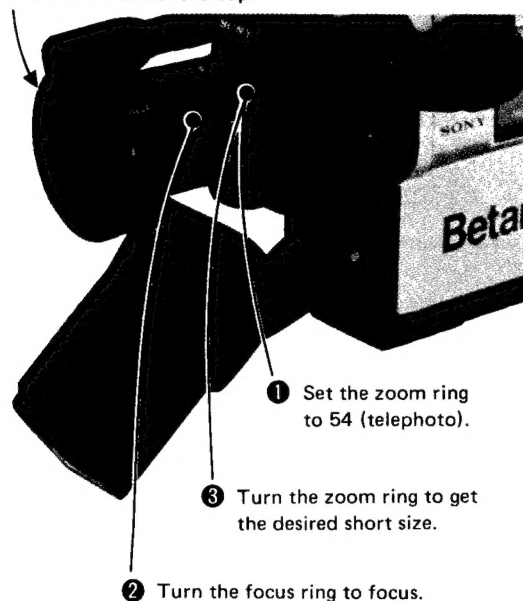
Adjust the length. (A tight belt makes operation easier.)

- 1 Unhook the buttons to open the cover.
- 2 Adjust the strap length to fit your hand.
- 3 Hook the buttons to secure the cover.

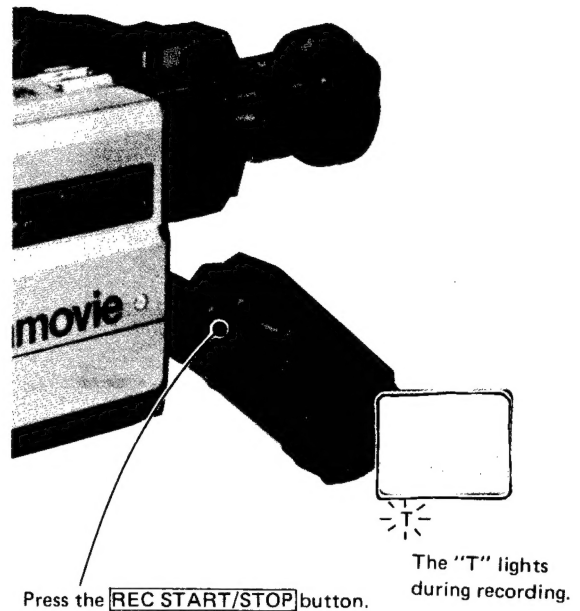
3 Focus

Adjust the eyesight correction ring to your eye, when using for the first time or after another person. (See page 12, 15.)

Remove the white lens cap.



4 Start recording



To stop recording momentarily

Press the **REC START/STOP** button again.

The **STANDBY** lamp is lit.

The unit is automatically turned off (the **STANDBY** lamp goes off) when it is in the standby mode over 3 minutes.

Monitoring the sound being recorded.

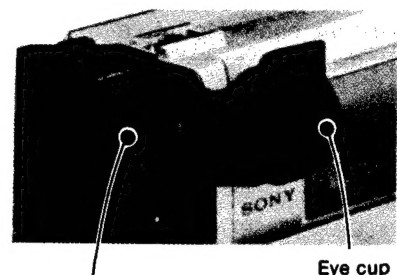
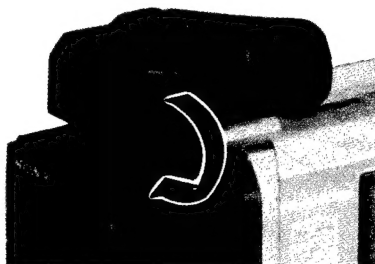
Plug the supplied eaphone into the **EARPHONE** jack and listen during recording.



3 Put the Betamovie on your shoulder, and put your right eye on the viewfinder eye cup.

Viewfinder

Fold down into operating position.



Lock into position securely.

Resting the Betamovie on your shoulder helps to keep it steady for shooting.

To start recording again

Press the **REC START/STOP** button again.

While the **STANDBY** lamp is lit.....

Recording starts immediately.

After the **STANDBY** lamp goes off.....

Recording starts after about 3 seconds.*

*It takes about 3 seconds for the picture tube warm-up before recording.

When you wish to start recording immediately, press the **POWER** button to set the Betamovie in the standby mode (the **STANDBY** lamp is lit.)

The battery power is also consumed in the standby mode as much as in the recording mode.

Smooth recordings can be made even if the recording is stopped and started again, unless the cassette is taken out.

5 Remove the recorded cassette.



If the battery power is exhausted and the compartment lid cannot be opened, replace with a charged battery or connect with an ac power adaptor.

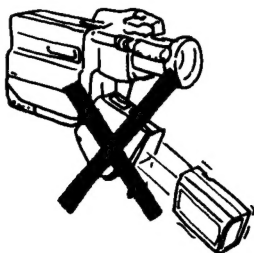
Run the tape for about 25 seconds **at the beginning of a cassette** before starting recording. Otherwise you may miss the starting point during playback when the tape is played back on video cassette recorders.

For "once-only" events such as weddings etc., it is strongly recommended to have a trial run to check that everything is working perfectly.

After recording

Take out the battery pack.

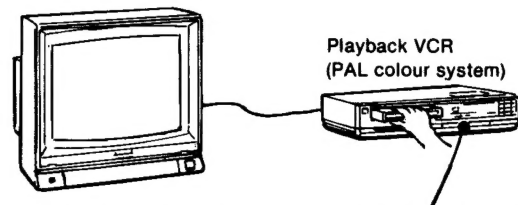
Hold the unit with the hand grip lid pointing up to open the battery compartment. Never point the lid downward as the battery pops out.



Charge the battery for the next use.

Playback of the tape

A video cassette recorder and a TV are required.



If streaks or snow appear on the TV screen, adjust the **TRACKING** control of the VCR for the best possible picture.

For details, refer to the instruction manual of the VCR.

1-3. THREE POINTS TO CONSIDER WHEN SHOOTING

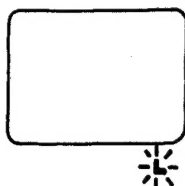
POINT 1

LIGHTING AND LIGHT DIRECTION

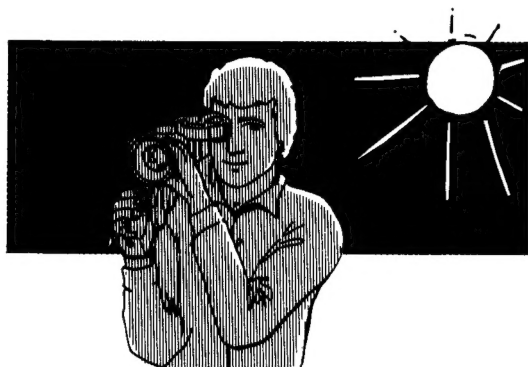
Is the subject sufficiently lighted? Actually, because the Betamovie uses Sony's SMF Trinicon® tube, recording can be done without special lighting. But for the best results, there are times when additional lighting is necessary.

When the light level is too low, the letter "L" will light in the viewfinder; increase the light level as necessary. The warning indicator will go out when the light level is satisfactory.

In the viewfinder



Generally, recording should be done with the sun at your back (front-lighting). This will illuminate the subject naturally and provide the best results from the very beginning of your recording.



It is also possible to record with the sun behind your subject (back-lighting), but this technique is more likely to produce less than satisfactory results until you become proficient. Front-lighting usually provides better results unless you're trying to create special effects

For further details, refer to the section "Brightness levels" in the HINTS FOR BETTER RECORDING section on page 13.

POINT 2

WHITE BALANCE

Because Betamovie uses an optical viewfinder, the image you see in it is usually the same colour as that of the subject. This is not always the case with the image being recorded, however, because of the fact that the colour of the subject can be affected by the colour temperature of the ambient light. The human eye has the ability to adapt to this situation, but a video camera does not. So to compensate for light temperature variations, the white balance control is used.

(See "Colour temperature" in the HINTS FOR BETTER RECORDING on page 13.)

White balance adjustment

First, set the **FILTER** to the appropriate ambient light position, depending on the most dominant light source.

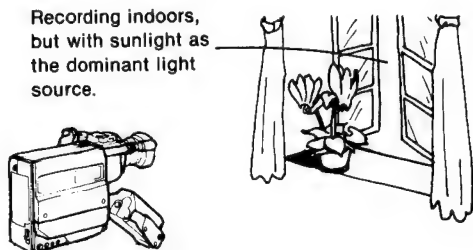


(blue) Recording outdoors in sunlight

(yellow) Recording indoors in incandescent or fluorescent light

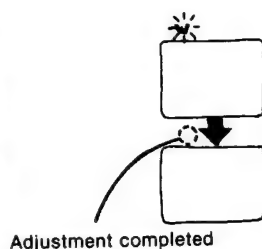
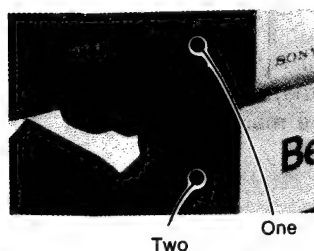
If the camera is indoors but the subject being recorded is in a window or outdoors, set the switch to the ☀ position.

Recording indoors, but with sunlight as the dominant light source.



With the **FILTER** set and the white lens cap in place on the lens hood, aim the lens at a light source (indoors) or a subject from a distance of at least two meters (outdoors). Then merely press the **WHITE BALANCE** button and the white balance will be perfectly adjusted automatically.

When adjusting white balance outdoors, more accurate adjustment can be made by setting the white balance in accordance with the light conditions the subject will be taped under. For example, if the subject will be taped in sunlight, **put the white lens cap on the lens hood** and point the camera toward the sun. If the subject will be taped in shadows, white balance should also be adjusted in shadows. When white balance adjustment is completed the "W" lamp in the viewfinder will go off.



Cautions on white balance adjustment

Losing white balance adjustment

The white balance adjustment is preserved for about 30 minutes after the power is turned off. If the power is off for more than 30 minutes, or if the **FILTER** selector position is changed, the white balance adjustment will be lost and the "W" lamp will light when the power is turned on. Set the white balance adjustment again as outlined above.

"W" lamp stays on after the WHITE BALANCE button is pushed.

- Adjustment cannot be made because of insufficient light (the "L" lamp will also light.)
- Adjustment cannot be made because of the presence of certain types of light, such as neon signs or tunnel lights.

Even if the "W" lamp does not go off, the white balance is nearly perfectly adjusted by the position of the **FILTER** selector, so recording is still possible.

Changing light sources

Because lighting remains basically the same for a given source, the white balance adjustment does not need to be changed very often. However, if a major light source change is made, such as from outdoor to indoor shooting, the white balance will have to be readjusted.

POINT 3

FOCUS

The first time you use the Betamovie, or if somebody else has been using the Betamovie, be sure to set the focus of the eyesight correction ring to your eyesight before recording.

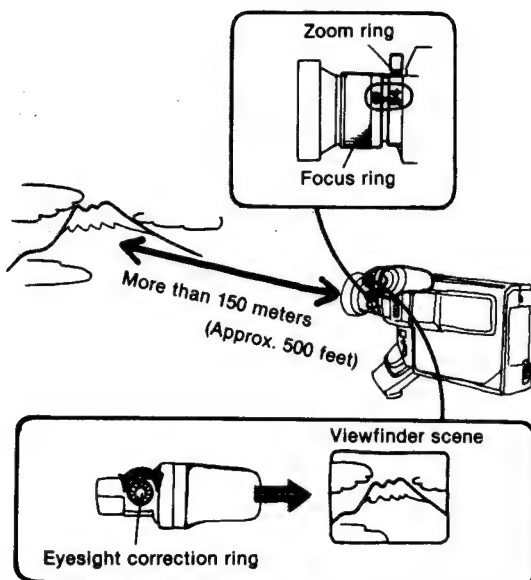
Eyesight adjustment

To properly use the optical viewfinder, it is first necessary to set the eyesight adjustment.

The distance of optimum vision varies from person to person, and the eyesight correction ring is incorporated to compensate for this. If this adjustment is not correct for the user, it is likely that the recorded images will not be in focus.

Using a subject

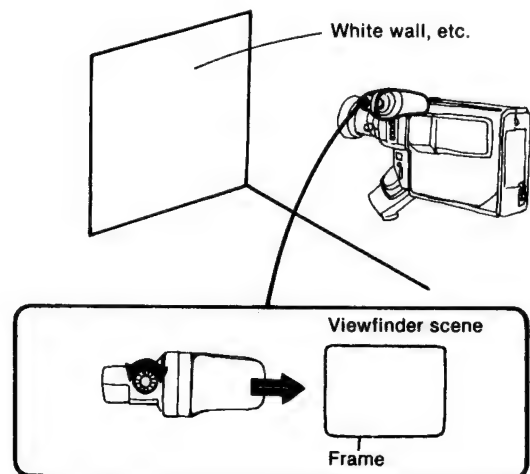
1. Set the zoom ring to 54 (telephoto) and the focus ring to ∞ (Infinity).
2. Center a distant subject (at least 150 meters away) in the viewfinder.
3. Turn the eyesight correction ring until the clearest image of the subject is obtained.



Using the viewfinder frame

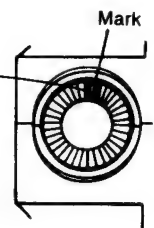
When a subject cannot be taken from a distance, such as in a room, etc.

1. Aim the Betamovie at a brightly-lit solid colour object.
2. Turn the eyesight correction ring until the viewfinder frame is in focus.



You will find it useful to remember the setting of the eyesight correction ring so that you can easily reset it should the position be changed.

It does not matter how many times the ring is rotated to the left or right: the only thing that matters is the position of the mark on the ring.



1-4. UNDERSTANDING LIGHT – FOR BETTER RESULTS

Brightness levels

The single greatest influence on picture quality is the brightness level. Using the following chart as a reference, take a few minutes to familiarize yourself with brightness levels to improve your recording.










When to use an ND filter

Exceptionally bright scenes such as sunny days at the beach in summer or on snow fields in winter will look “washed out” when recorded. To make these scenes recorded naturally, an ND filter is required. (Refer to the chart) Three types are available—ND2, ND4, ND8—which reduce the exposure level to 1/2, 1/4, and 1/8, respectively. Select filters to match the lens diameter of 52 mm.

ND filter required	Unit: lux	
	100,000	Snow-covered mountains Snow fields Sandy beach, clear day in summer
Normal recording	10,000	Clear day, mid-day (100,000) Clear day, mid-afternoon (35,000) Overcast day, mid-day (32,000)
	1,000	Overcast day, one hour after sunrise (2,000) Office lit by fluorescent lamps, near window (1,000) Clear day, one hour before sunset (1,000) Department store counter (500~700) Station wicket (650)
	500	
	100	Office lit by fluorescent lamps (400~500) Room lit by two 30 W Fluorescent lamps (300) Subway station platform (300) Arcade at night (150~200)
Video light recommended	100	
Video light required	10	Theater lobby (15~35) Candle light (10~15)

Colour temperature – how it effects white balance adjustment

If the temperature of an object continues to increase, it will eventually begin giving off light. At this time, there is a fixed relationship between the object's temperature and its “light colour.” The temperature of the object radiating the light is expressed in absolute temperature (°K). This is also known as the colour temperature, which in turn stands for “light colour.” As colour temperature increases, the light colour changes from red to yellow to white to blue.

Natural light colour temperature (°K)	Colour change	Artificial light colour temperature (°K)
Clear sky Slightly overcast 	10,000(°K) ↑ 10,000(°K)	
Cloudy, rainy 	8,000 ↑ 8,000	
	7,000 Blue 7,000	
	6,000 ↑ 6,000	
Direct sunlight 	5,000 ↑ 5,000	Fluorescent lamp (clear) 
2 hr.		
	4,000 White 4,000	Fluorescent lamp (white) 
1 hr.		
	3,500 ↑ 3,500	Flourescent lamp (off white) 
40 min.		Studio lamp Halogan lamp 
	3,200 ↑ 3,200	
	3,000 ↑ 3,000	
	Yellow	
	2,500 ↑ 2,500	Tungsten lamp 
30 min.		
	2,000 Red 2,000	
20 min.		
	↓	Candle light 
Sunrise/sunset		

1-5. CHARACTERISTICS OF OPTICAL VIEWFINDERS

- **Color pictures are available...**

Subjects which tend to merge with the background, such as a flower or bird in the woods or a rabbit in a field of snow, which would be hard to see with a black-and-white viewfinder, can be clearly distinguished.

- **Compact and light-weight...**

- **Always ready...**

Color pictures are always viewable in the viewfinder, even without the Betamovie turned on. Recording can start after about 3 seconds even if the unit is not in the standby mode.

- **Power saving...**

While an electronic viewfinder needs power to operate, an optical viewfinder consumes no power at all.

These are the reasons why an optical viewfinder is used for the Betamovie.

Keep in mind, however, that the picture being recorded is not exactly the picture shown in the optical viewfinder...

Note that you must set the eyesight adjustment of the viewfinder before you can focus accurately.

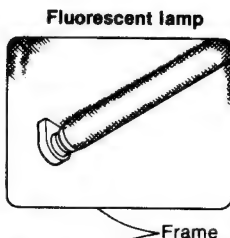
1-6. EYESIGHT ADJUSTMENT

First, set
the focus ring at ∞
the zoom ring at 54.

Select one of the following methods.

Indoors

Method 1 Remove the white lens cap and aim the unit at a fluorescent lamp. (It is not necessary that the focus ring be adjusted at this point.)



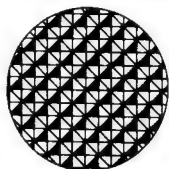
Method 2 Aim at an incandescent lamp with the white lens cap on.



Method 3 Remove the white lens cap and aim at a brightly-lit white object.

White lens cap attached or brightly-lit white object

Now adjust the eyesight correction ring so that the viewfinder frame is the clearest. Focusing the viewfinder requires some skill. You will know the viewfinder is focused when the image is broken up into very fine lines.



Enlargement of "fine lines" in the viewfinder

Outdoors

Method 1 (Daytime.) Center a subject at least 150 meters (500 feet) away in the viewfinder. Adjust the eyesight correction ring until the clearest image of the subject is obtained.

Method 2 (Night time.) Center a light at least 150 meters (500 feet) away in the viewfinder. Adjust the ring until the light is clear.



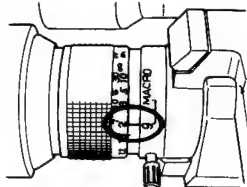
When the subject is the clearest, the "fine lines" are seen.

When the eyesight adjustment has been completed, the viewfinder frame is the clearest, the image in the viewfinder will be clear and broken up into very fine lines.

1-7. FOCUSING

How to be (almost always) in focus -rough focus

Make sure the eyesight adjustment is properly set.
Set the focus ring at **2m** and the zoom ring at **9** and leave them at these settings.



At these settings, the depth of field (the range in which the picture will be in focus) is:

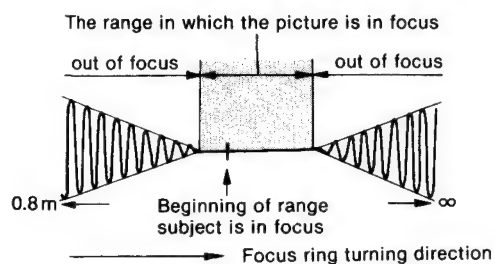
Indoors from 1.2m to 9.5m (4 to 31 feet)
Outdoors on a clear day from 40cm (16 inches) to ∞ (infinity)

Use the viewfinder simply to frame the picture.

How to focus precisely

Make sure the eyesight adjustment is properly set.

- 1 Set the zoom ring at **54** and the focus ring at **0.8m**.
- 2 Turn the focus ring toward ∞ until the point at which the subject **begins to come into focus**.

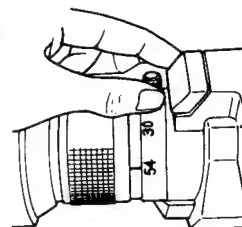


Now you are ready to start recording.

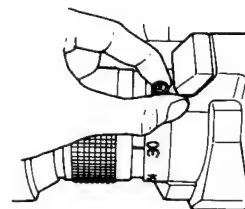
The closer the zoom ring is to **9**, the deeper the depth of field becomes. Shoot pictures as wide as possible (**30** and under) if there is no need to be telephoto. Be sure to focus for each shot with the zoom ring at **54**.

An easy way to manipulate the zoom ring for focusing while looking through the viewfinder.

- 1 Turn the zoom lever to **54** with your thumb.



- 2 Place the thumb of the left hand as shown, and with your forefinger turn the lever until it touches your thumb. The value of the zoom ring will be around **30** at this point.

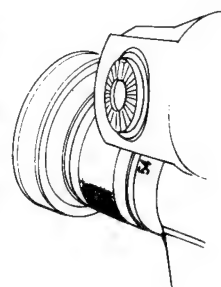


Practice eyesight adjustment and focusing over and over on the same tape until you are satisfied with the results.

It is better to practice on a subject with letters or lines on it, rather than a landscape. You might find it useful to record your voice as you practice — "Now the subject is just coming into focus" — so that you can see the relation between focus in the viewfinder and focus of the recorded subject.

To monitor the value of the zoom ring while looking through the viewfinder

Open your left eye to see the zoom ring while keeping your right eye in the viewfinder. When you see **54**, the ring is set approximately at **30**. With practice, you can estimate the value of the zoom ring by the number seen with your left eye.



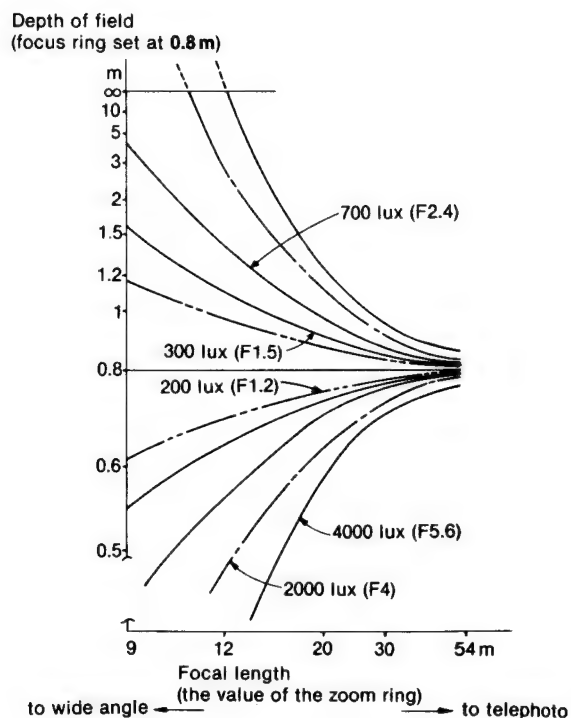
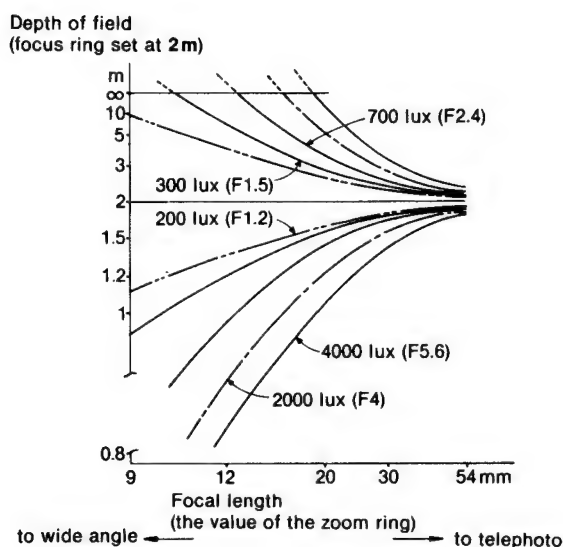
1-8. DEPTH OF FIELD

—Refer to the charts below.

In any lens a subject which extends some distance either side of the focal point can be shot in focus, as long as it falls within the "depth of field."

The depth of field varies depending on the lens' focal length (wide angle or telephoto), the amount of light and the distance from the subject.

The figures on the focus ring indicate the distance between the front of the lens (not including the lens hood) and the subject when the subject is in focus.



For a sharp picture, please observe the following points.

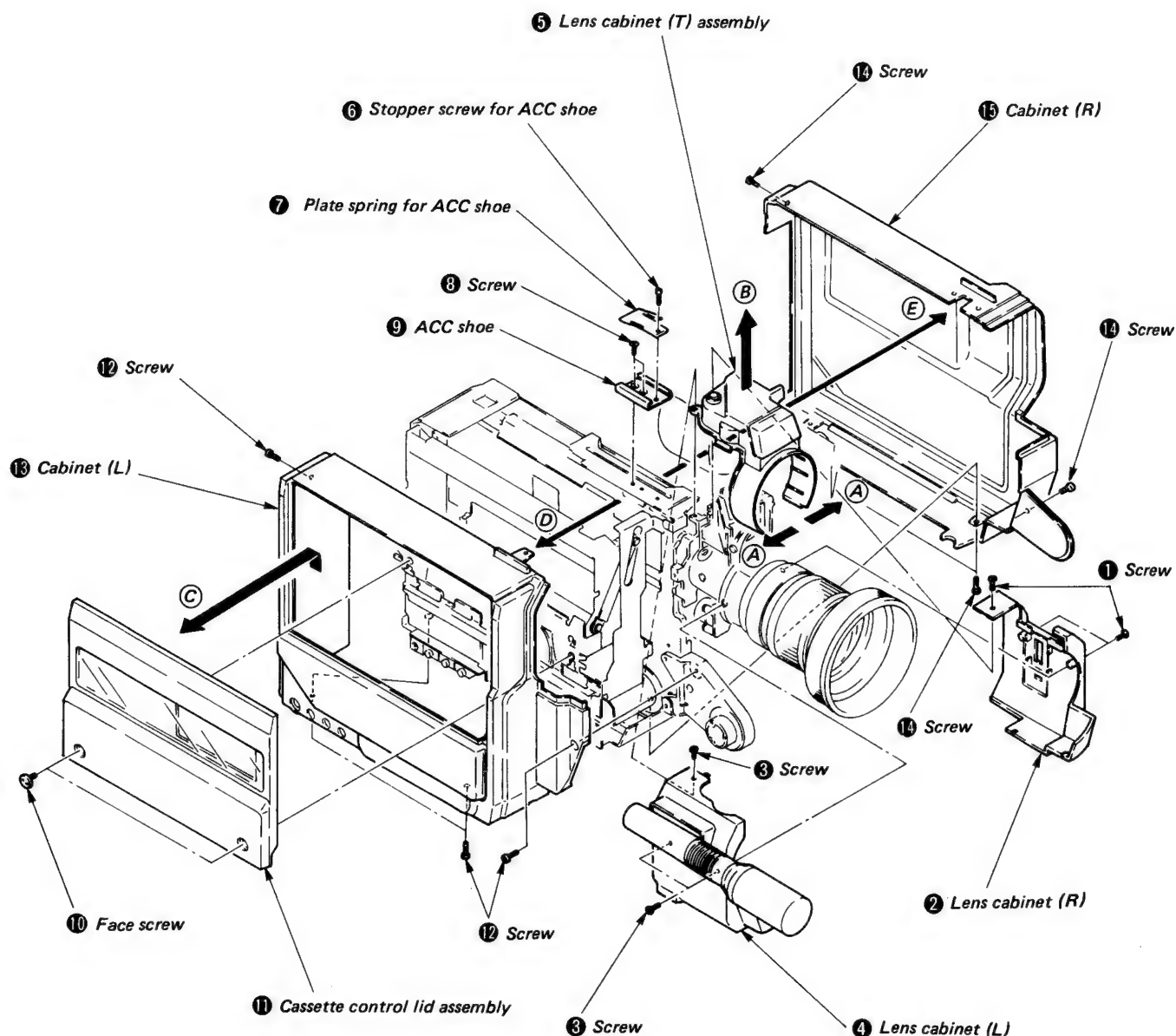
- 1 Get close to the subject.
- 2 Use a wide angle shot.
- 3 Make sure the light is sufficient.

These three points apply to any type of video camera.

SECTION 2 DISASSEMBLY

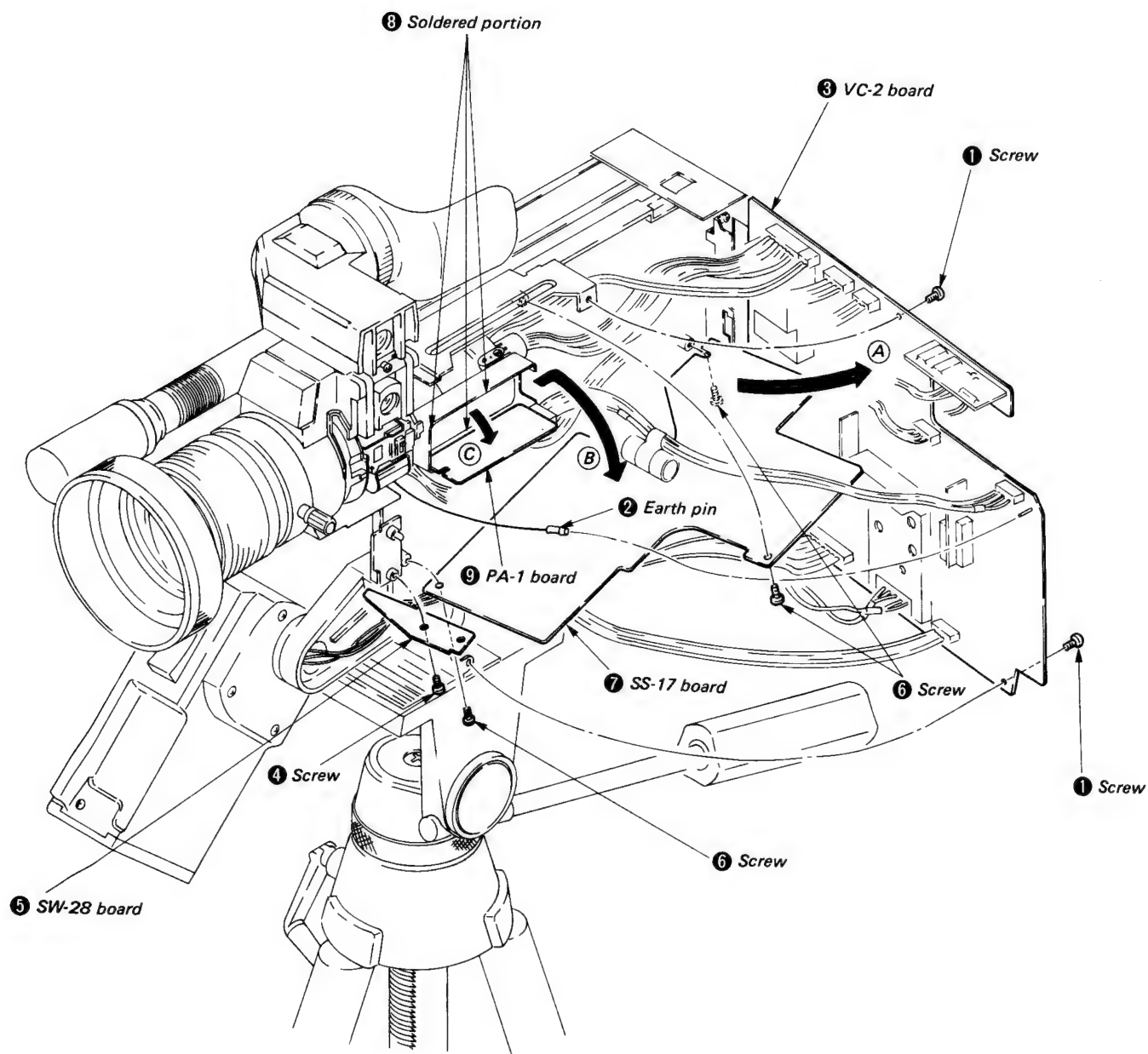
2-1. CABINET REMOVING PROCEDURE

- ① Remove three screws (+P2 x 8).
- ② Remove lens cabinet (R).
- ③ Remove three screws (+P2 x 8).
- ④ Remove lens cabinet (L).
- ⑤ Remove lens cabinet (T) assembly in the direction of arrow **(B)** after opening it in the direction of arrow **(A)**.
- ⑥ Remove Stopper screw for ACC shoe.
- ⑦ Remove plate spring for ACC shoe.
- ⑧ Remove two screws (K2.6 x 6).
- ⑨ Remove ACC shoe.
- ⑩ Remove two face screws.
- ⑪ Remove cassette control assembly in the direction of arrow **(C)**.
- ⑫ Remove four screws (+B2.6 x 6).
- ⑬ Remove cabinet (L) in the direction of arrow **(D)**.
- ⑭ Remove four screws (+B2.6 x 6).
- ⑮ Remove cabinet (R) in the direction of arrow **(E)**.



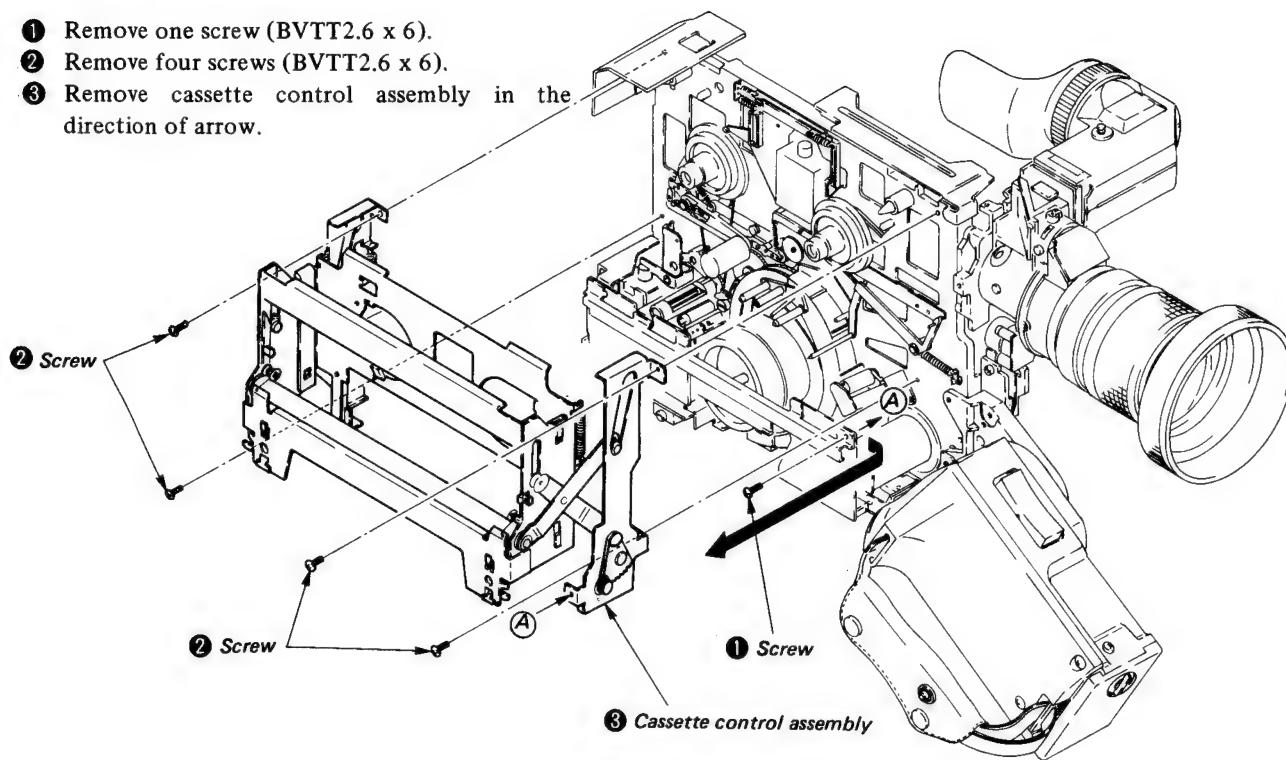
2-2. PROCEDURE FOR OPENING SS-17 AND VC-2 BOARDS

- ① Remove two screws (BVTT2.6 x 6).
- ② Pull out earth pin.
- ③ Open VC-2 board in the direction of arrow (A).
- ④ Remove one screw (+PTP2.6 x 10).
- ⑤ Remove SW-28 board.
- ⑥ Remove three screws (BVTT2.6 x 6).
- ⑦ Open SS-17 board in the direction of arrow (B).
- ⑧ Remove soldered portions of PA field case and PA-1 board.
- ⑨ Open PA-1 board in the direction of arrow (C).



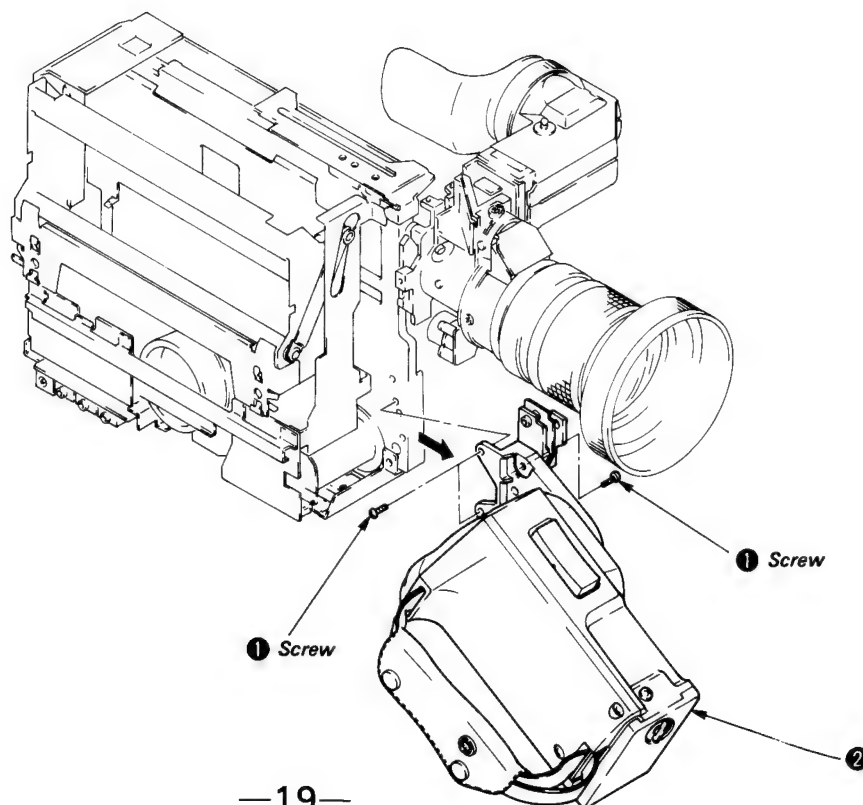
2-3. PROCEDURE FOR REMOVING CASSETTE CONTROL ASSEMBLY

- ① Remove one screw (BVTT2.6 x 6).
- ② Remove four screws (BVTT2.6 x 6).
- ③ Remove cassette control assembly in the direction of arrow.



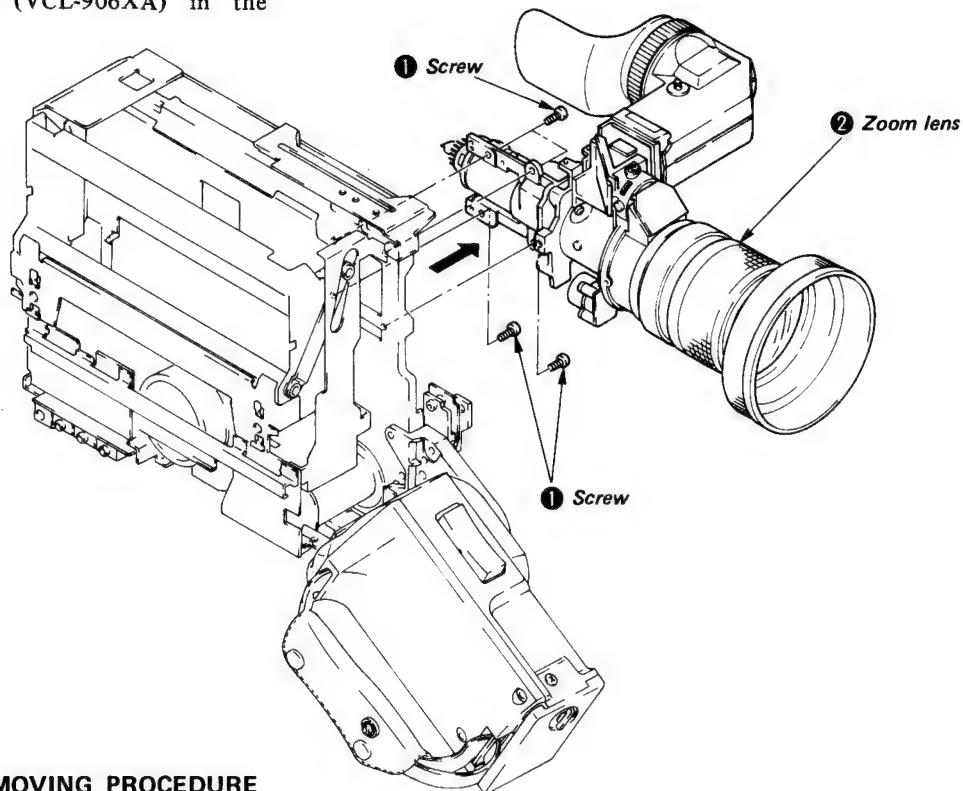
2-4. GRIP REMOVING PROCEDURE

- ① Remove three screws (BVTT2.6 x 8).
- ② Remove grip in the direction of arrow.



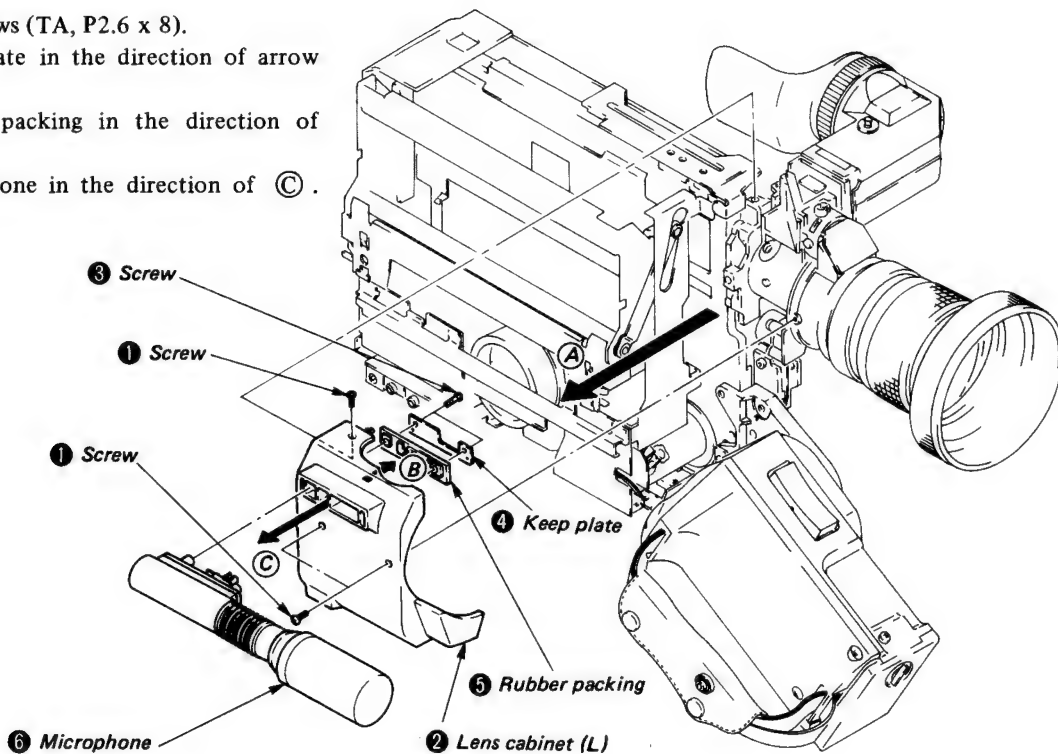
2-5. ZOOM LENS (VCL-906XA) REMOVING PROCEDURE

- ① Remove four screws (BVTT2.6 x 8).
- ② Remove zoom lens (VCL-906XA) in the direction of arrow.



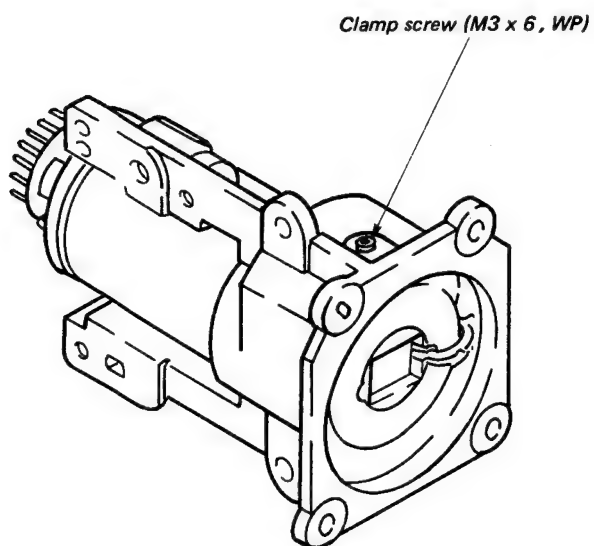
2-6. MICROPHONE REMOVING PROCEDURE

- ① Remove three screws (+P2 x 8).
- ② Remove lens cabinet (L) in the direction of arrow (A).
- ③ Remove two screws (TA, P2.6 x 8).
- ④ Remove keep plate in the direction of arrow (B).
- ⑤ Remove rubber packing in the direction of arrow (B).
- ⑥ Remove microphone in the direction of (C).

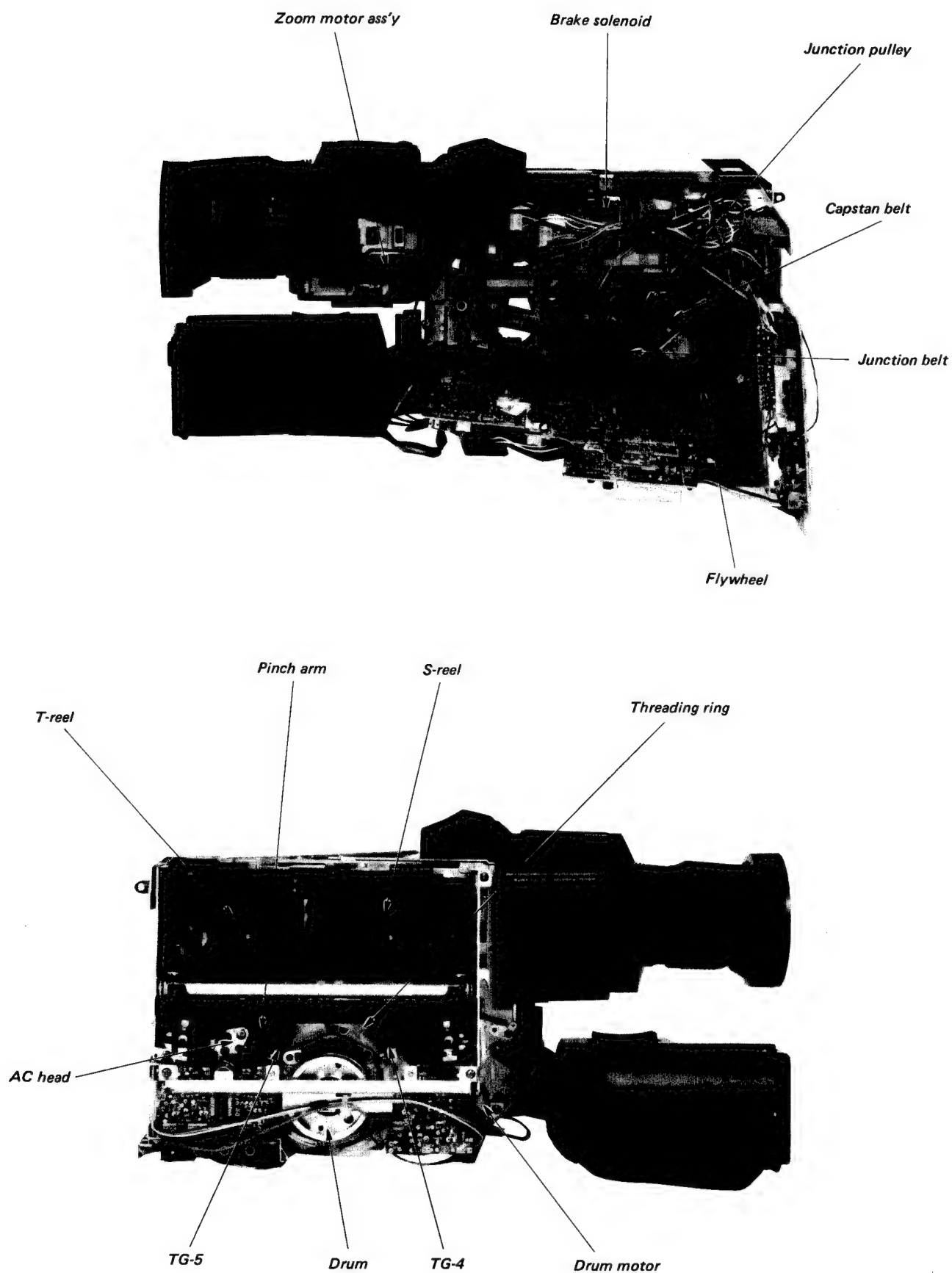


2-7. CAUTION WHEN REPLACING CAMERA TUBE

When tightening the clamp screw of camera tube (for replacement), tighten the clamp screw with a torque of $5.0\text{kg}\cdot\text{cm} \pm 1\text{kg}\cdot\text{cm}$.

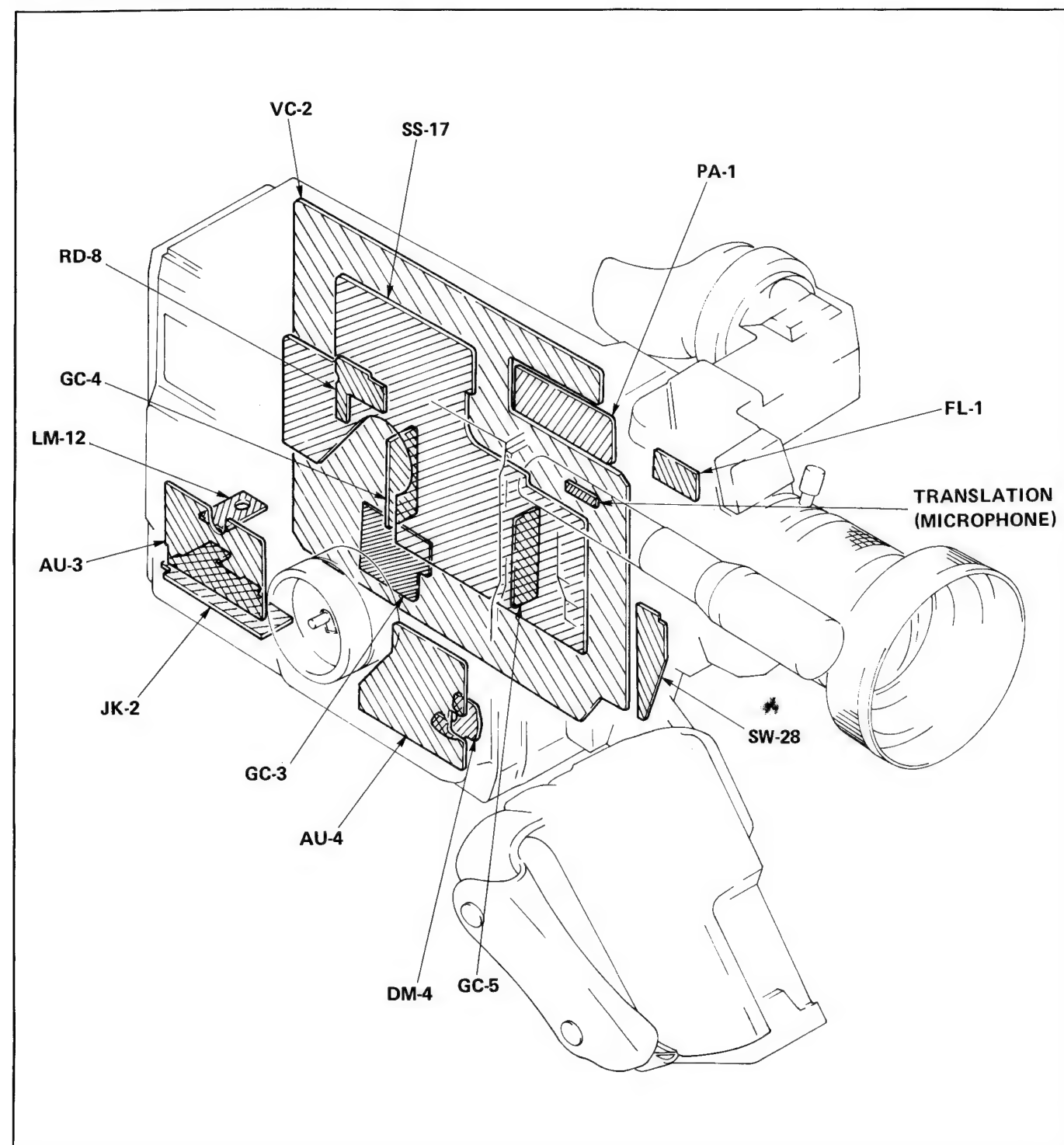


2-8. INSIDE VIEWS

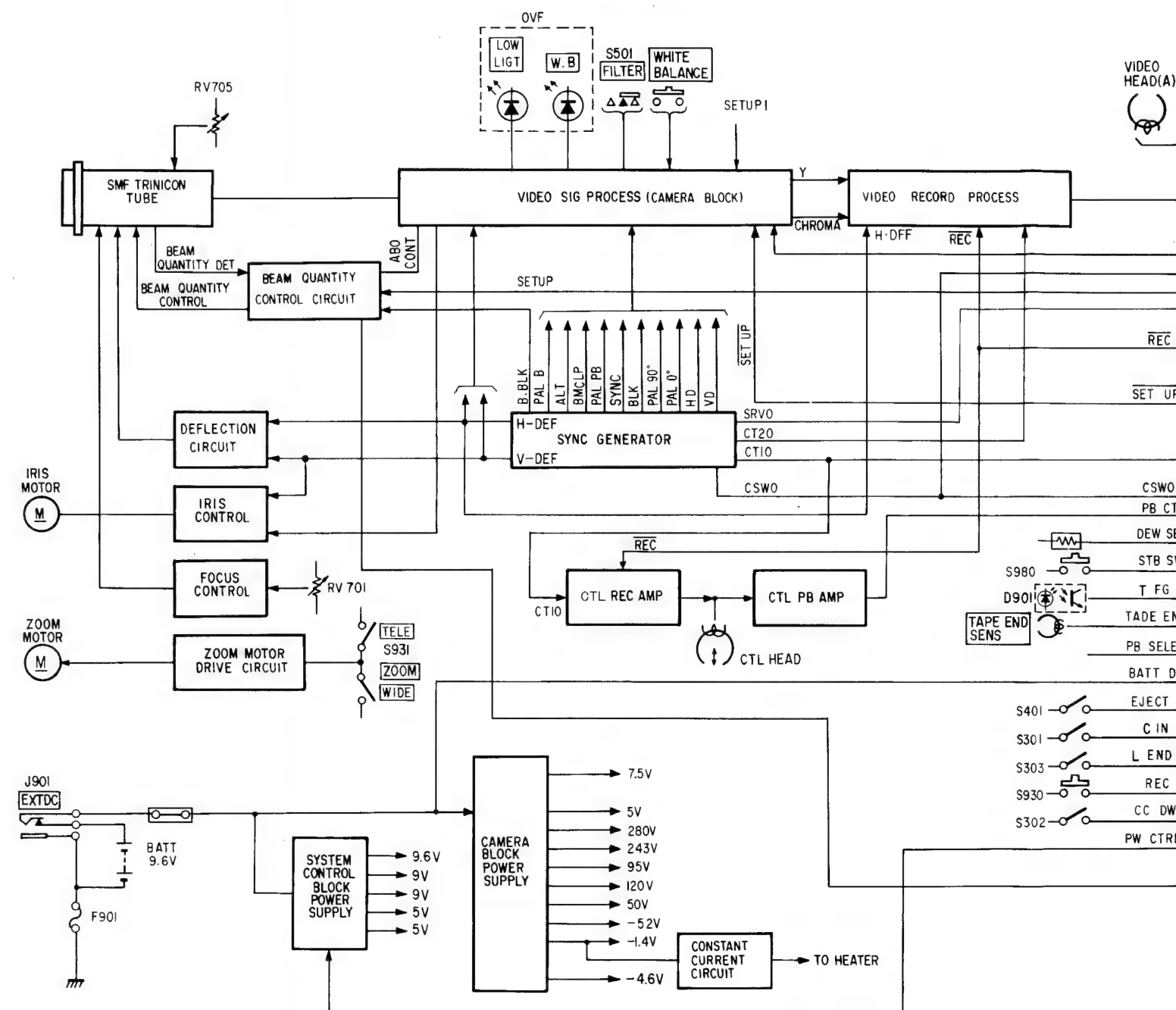


SECTION 3 BLOCK DIAGRAMS

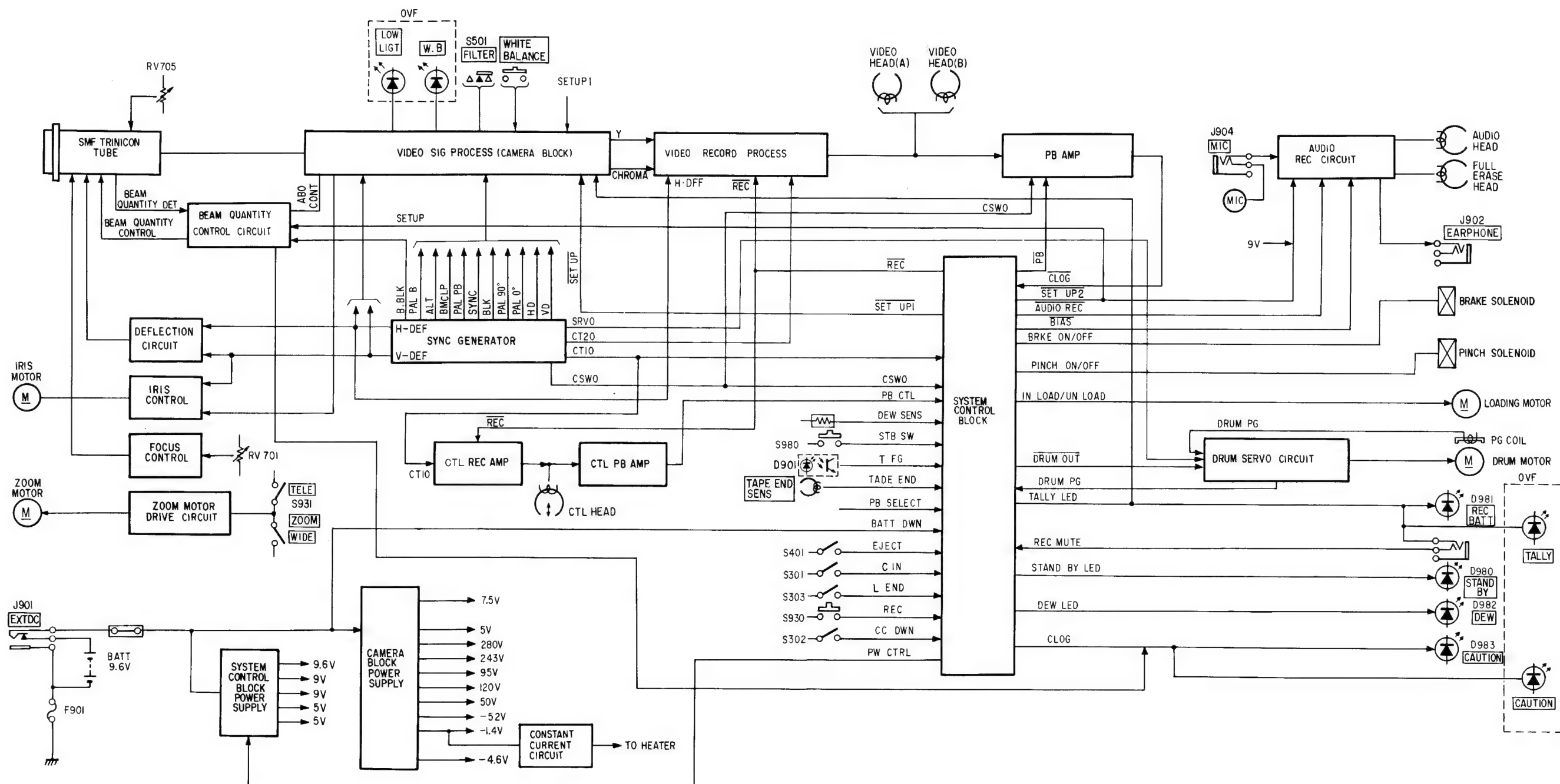
3-1. CIRCUIT BOARDS LOCATION



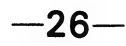
3-2. OVERALL BLOCK DIAGRAM

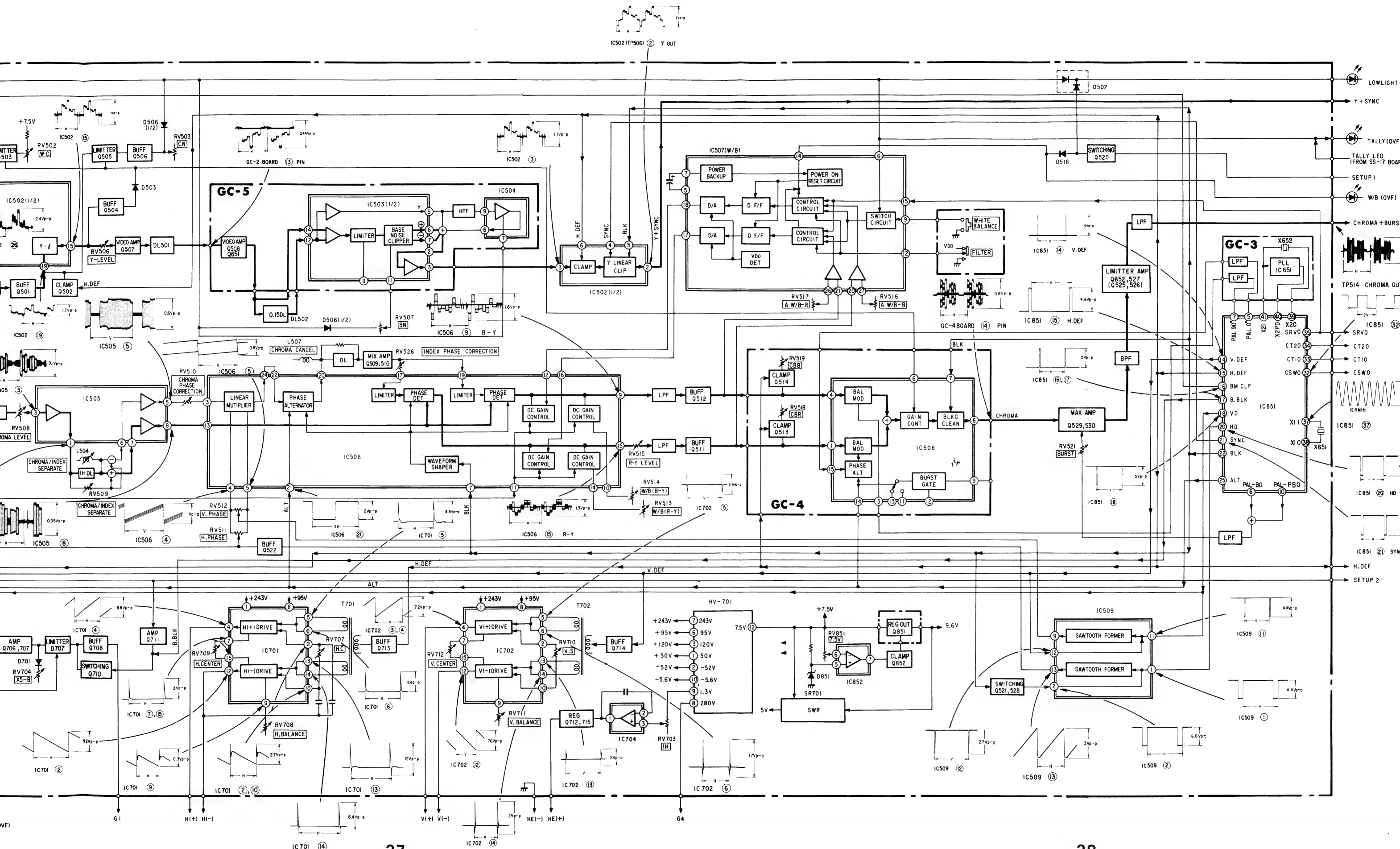


3-2. OVERALL BLOCK DIAGRAM

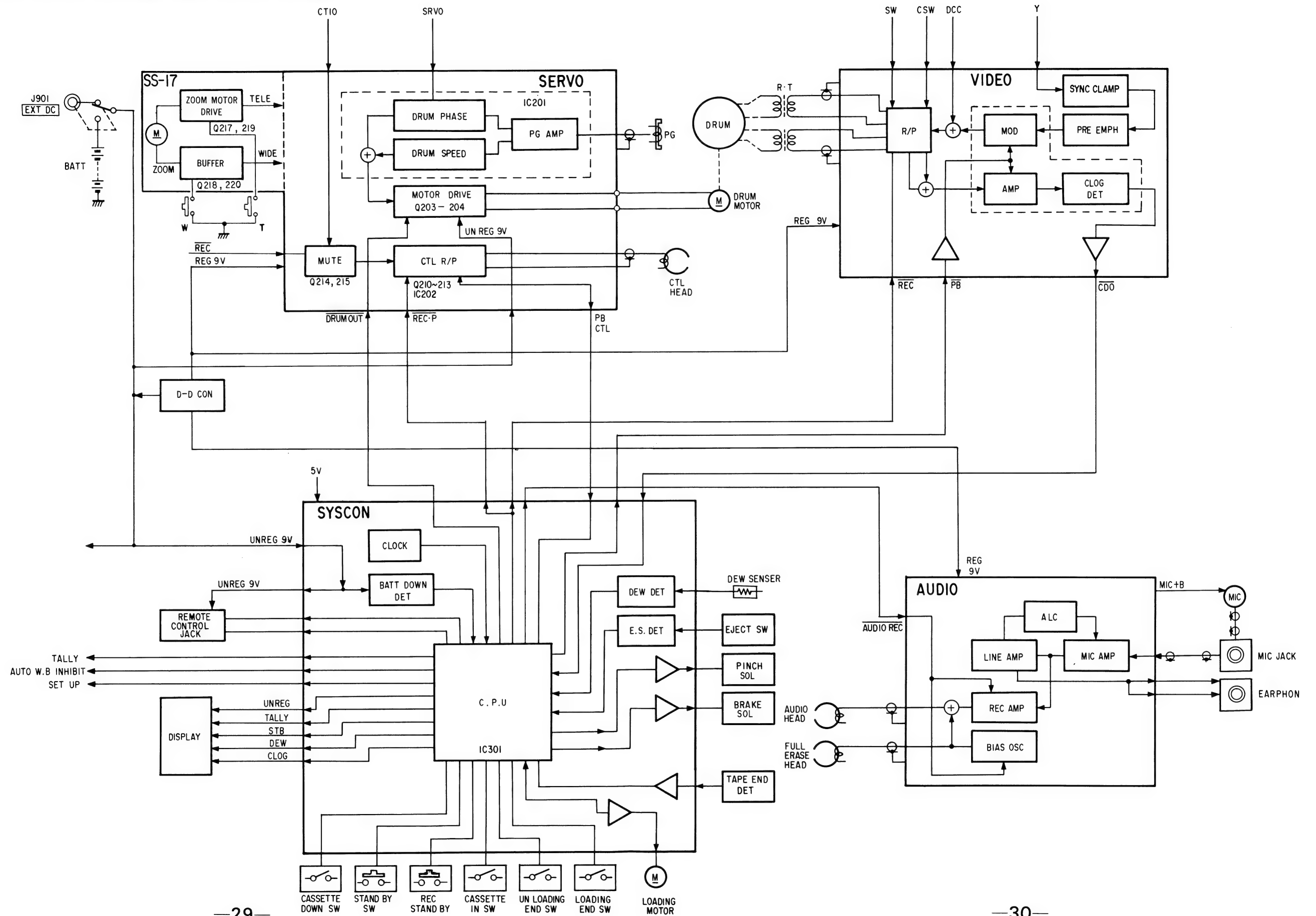


IC502 (TP506) ② Y OUT

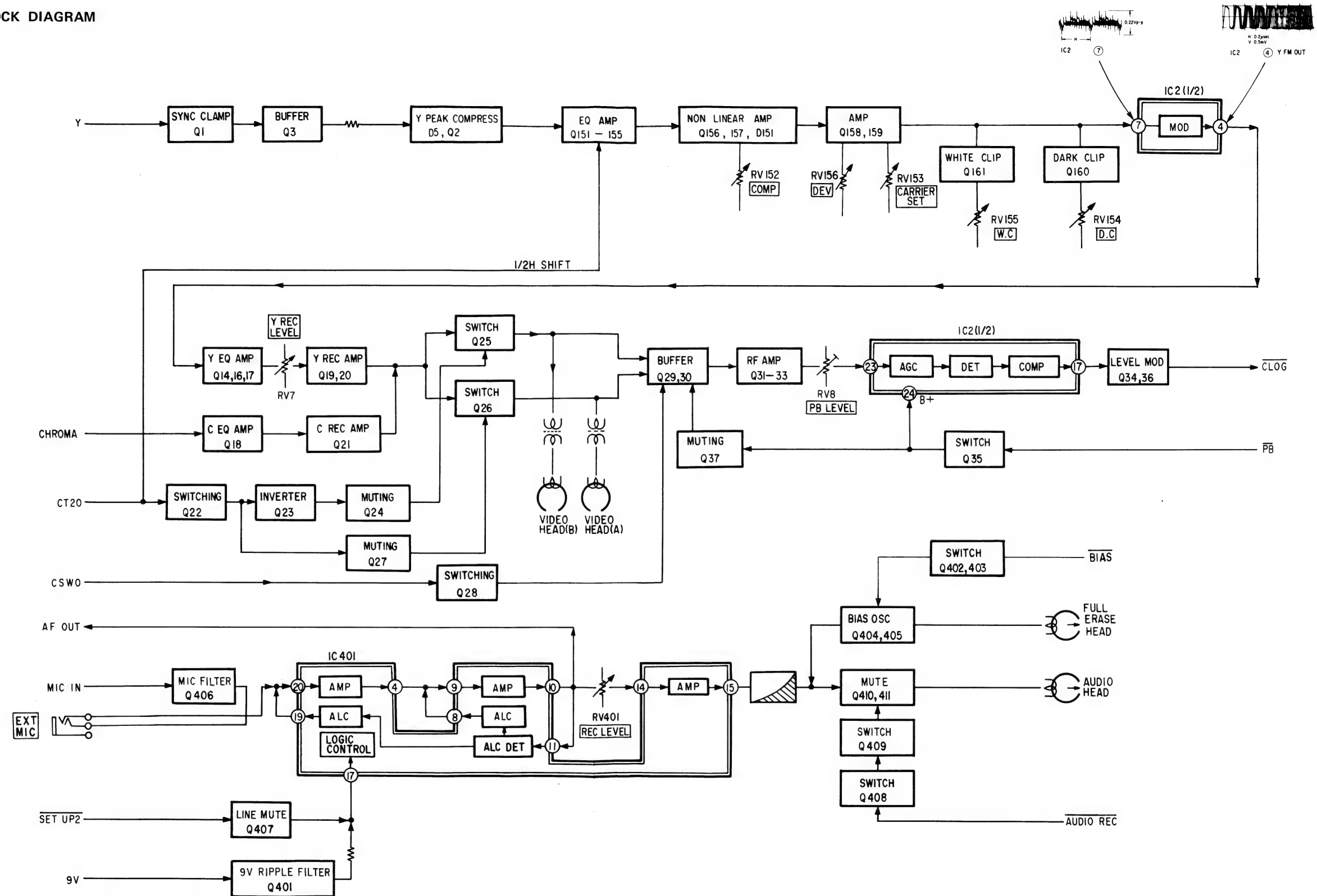




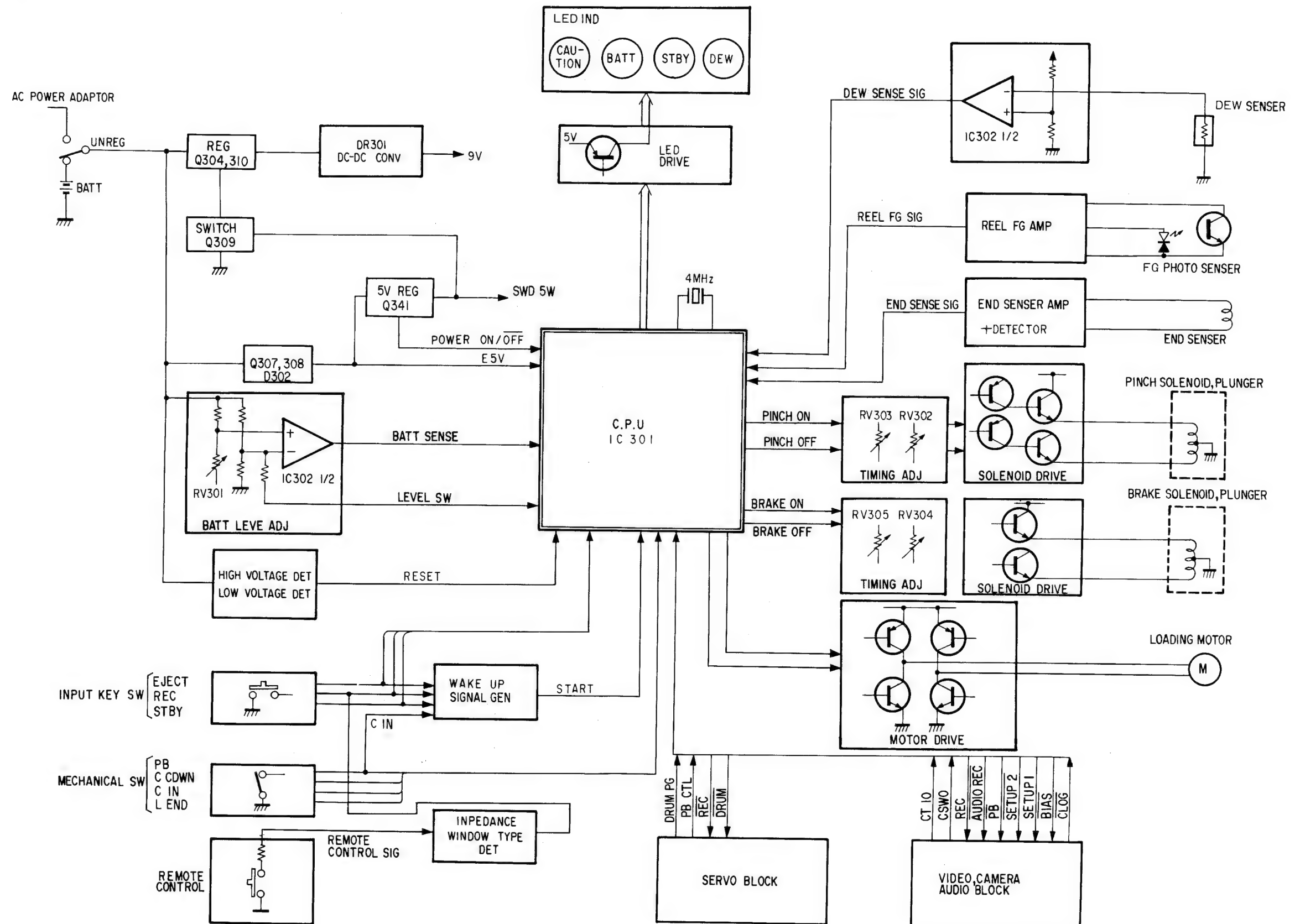
3-4. VIDEO BLOCK DIAGRAM (INCLUDING SERVO BLOCK DIAGRAM)



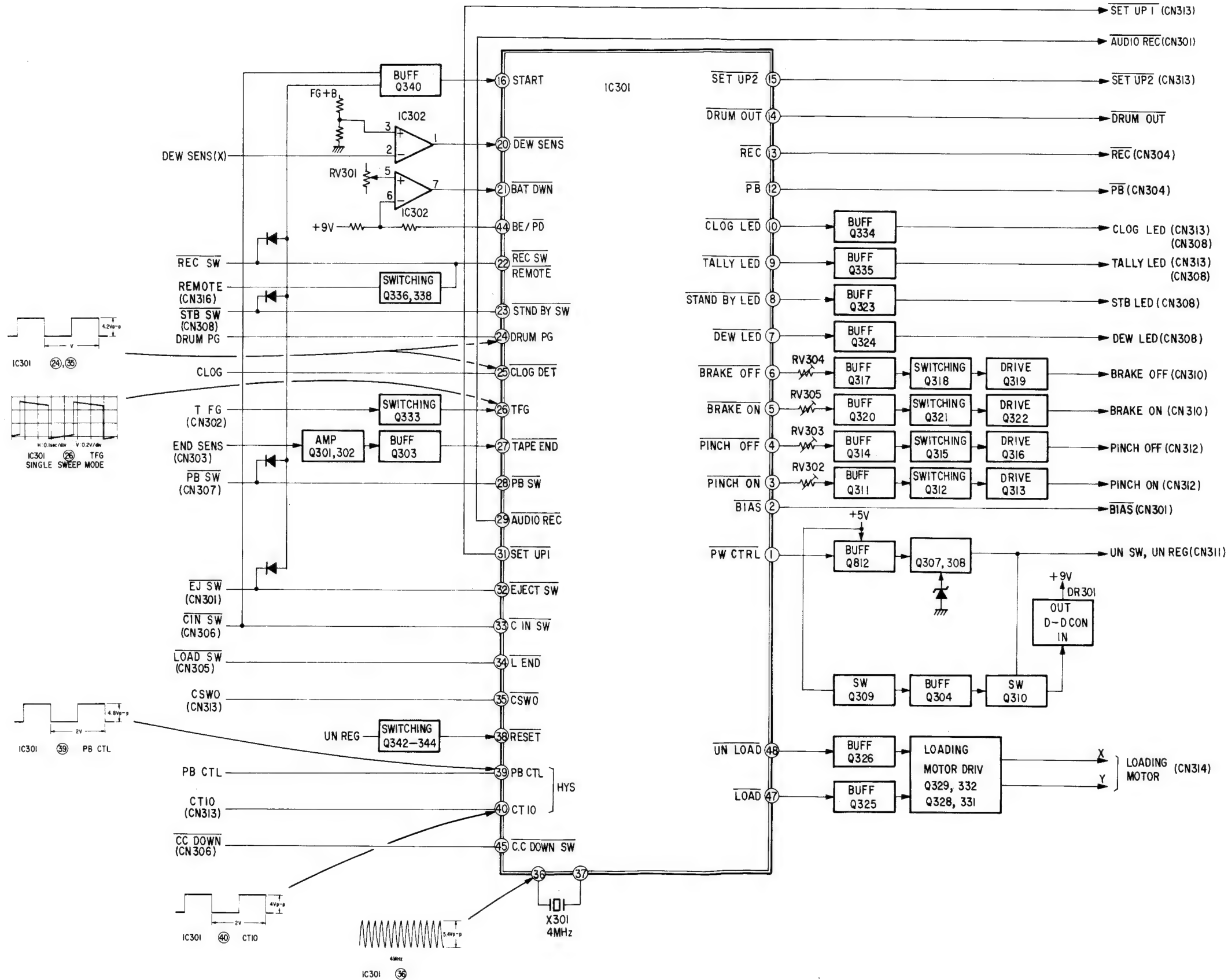
3-5. VIDEO, AUDIO BLOCK DIAGRAM



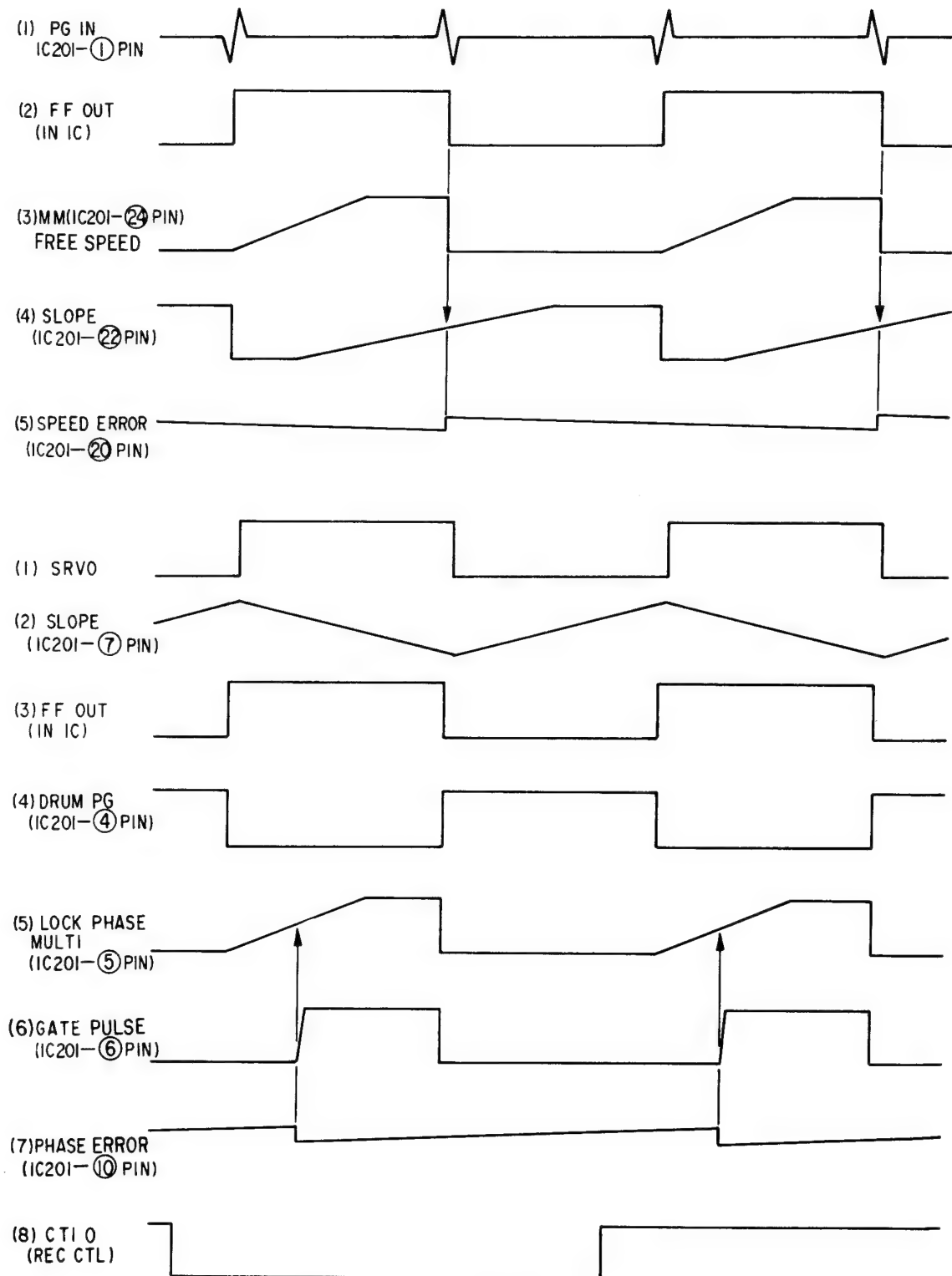
3-6. SYSTEM CONTROL BLOCK DIAGRAM (1)



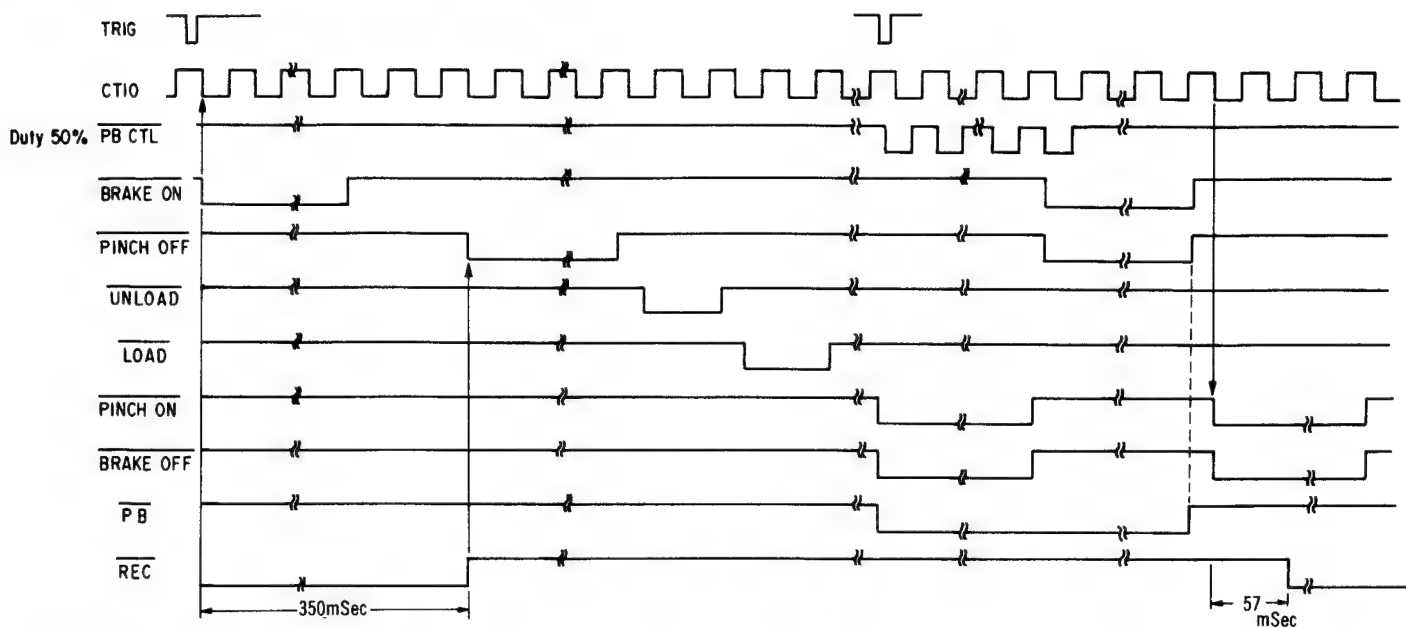
3-7. SYSTEM CONTROL BLOCK DIAGRAM (2)



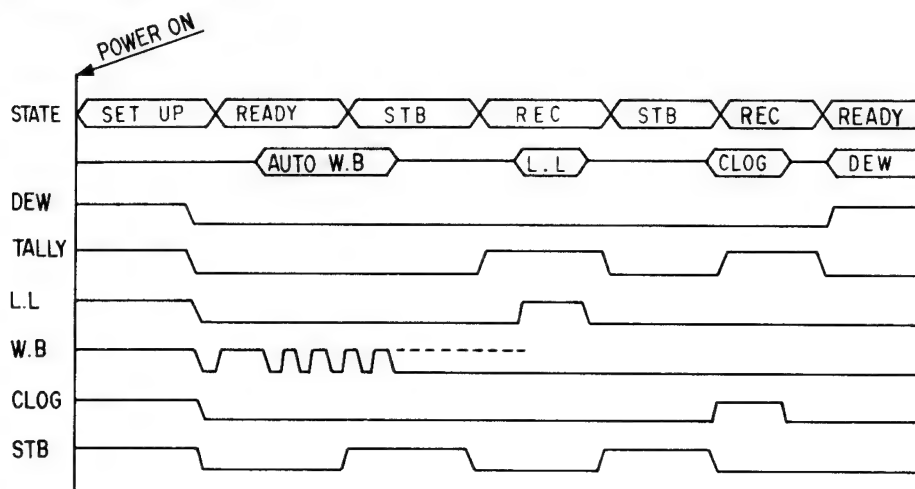
3-8. SERVO TIMING CHART



3-9. LINKED SHOOTING TIMING CHART



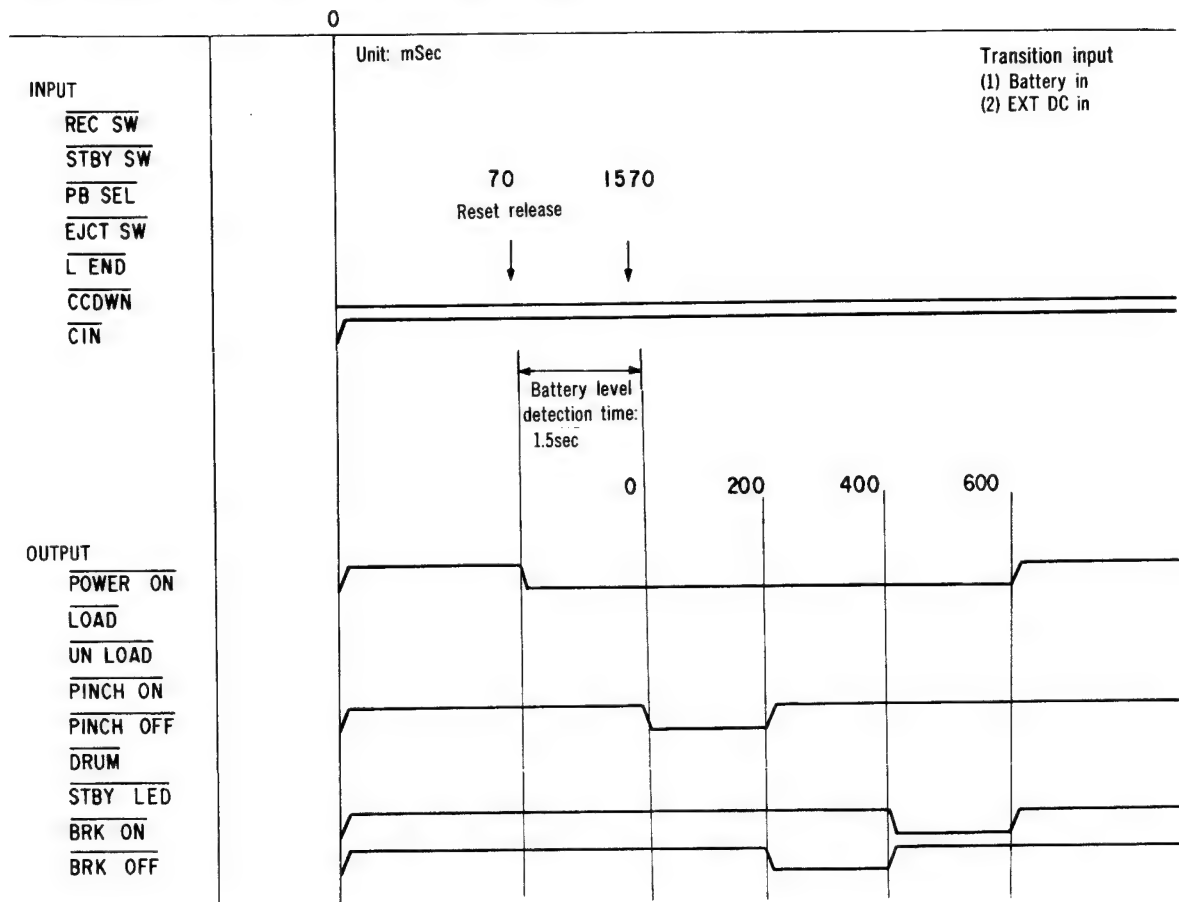
3-10. WARNING TIMING CHART



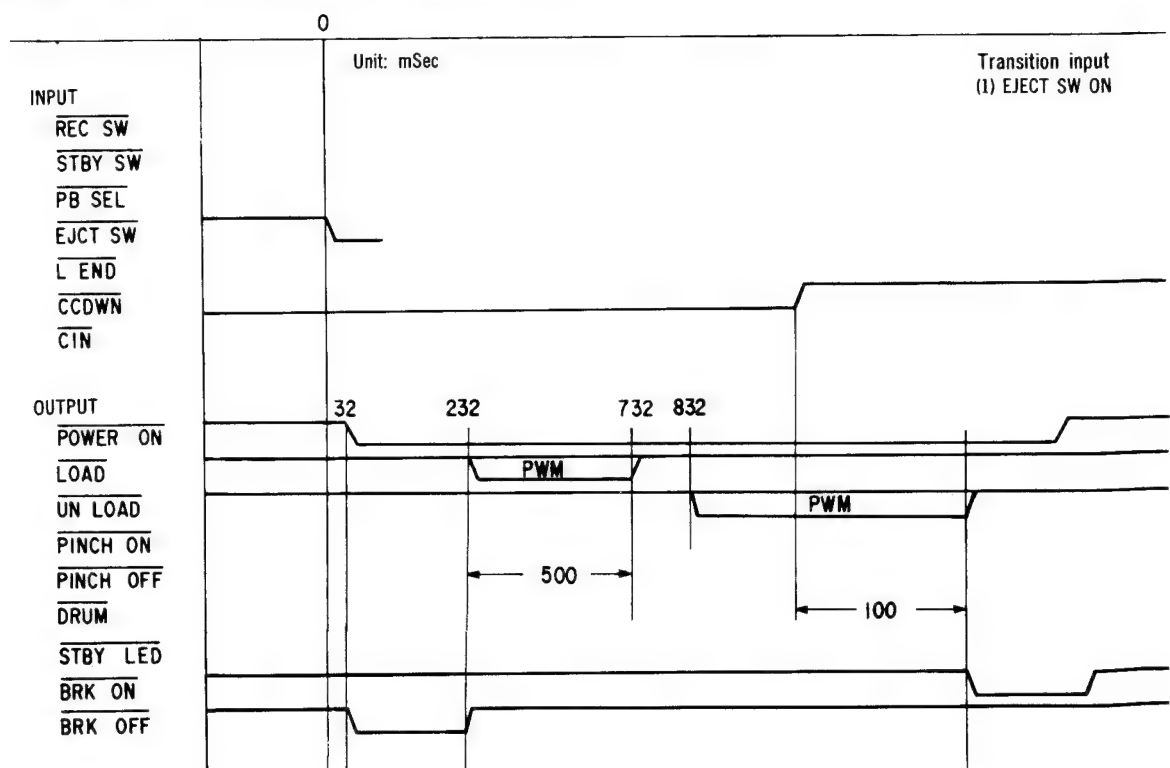
○ TURN-ON ● BLINK

INDICATION WARNING item	DEW	TALLY	L.L	W.B	CAUTION	
DEW	○					
BATTERY POWER REMAINED		● 1Hz				
BATTERY DOWN		● 5Hz				
LOW LIGHT			○			
W.B NG/UNPROCESSED				○		
AUTO W.B OPERATION				● 15Hz		
CLOG					● 1Hz	
BEAM					○	

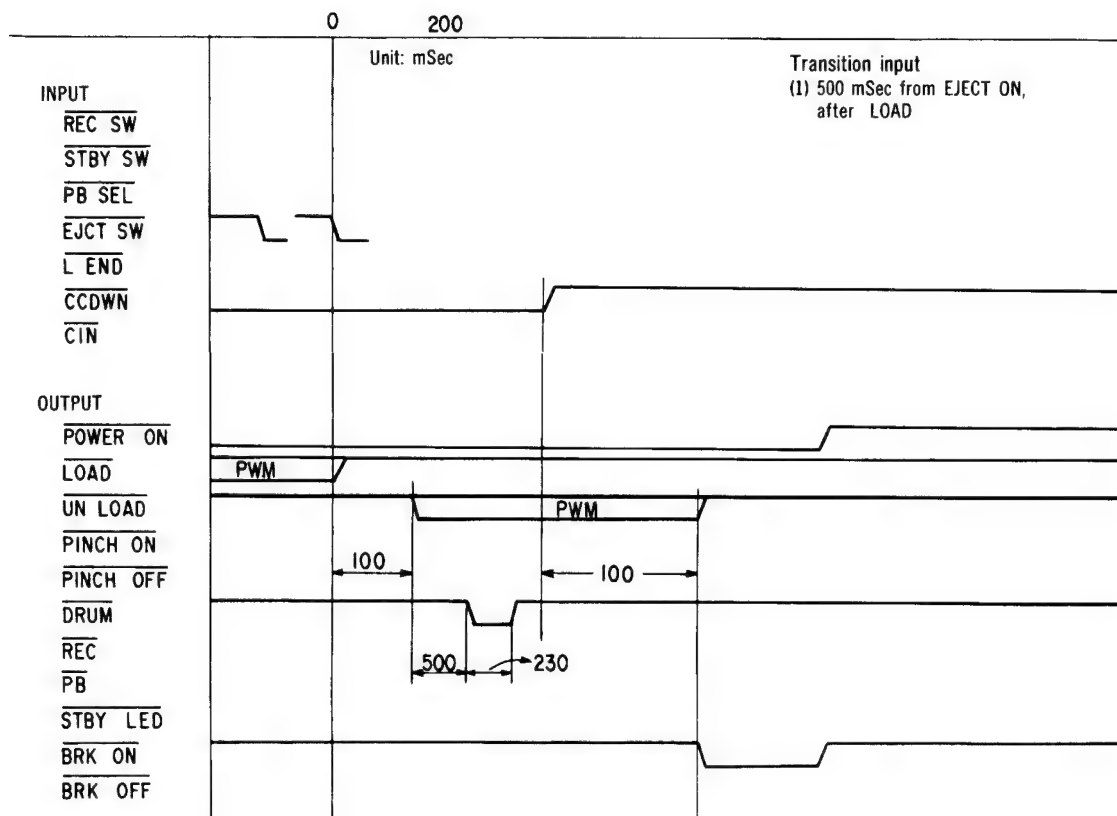
3-11-1. ALL OFF→HOLDER DOWN TIMING CHART



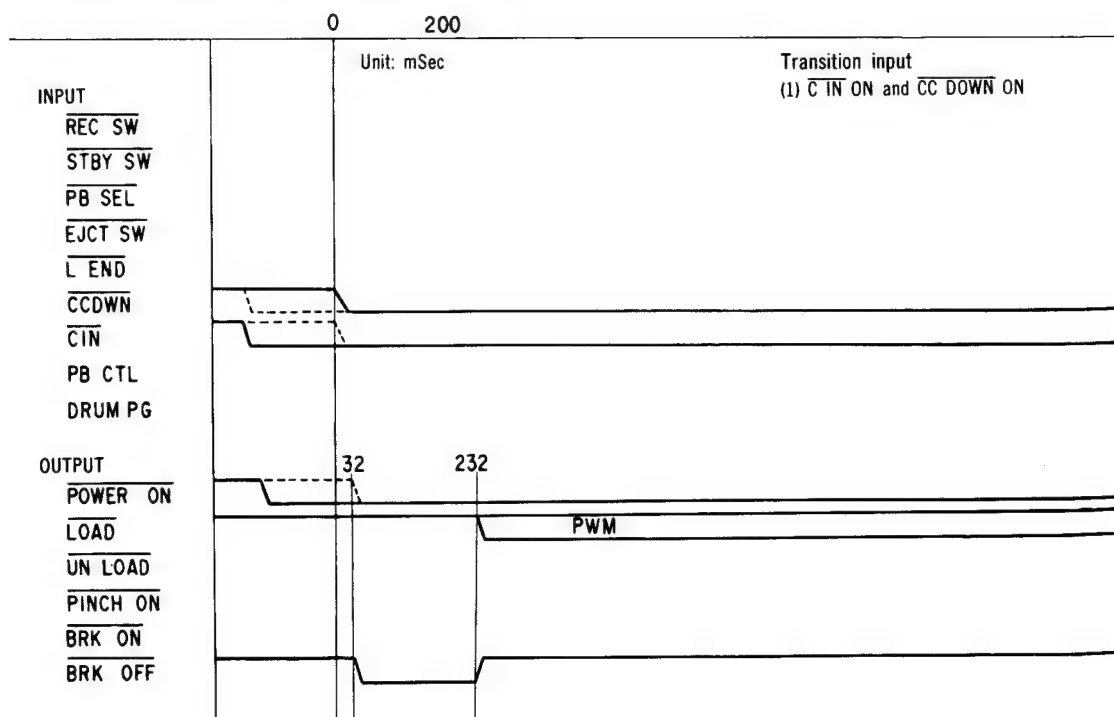
3-11-2. HOLDER DOWN→HOLDER UP TIMING CHART



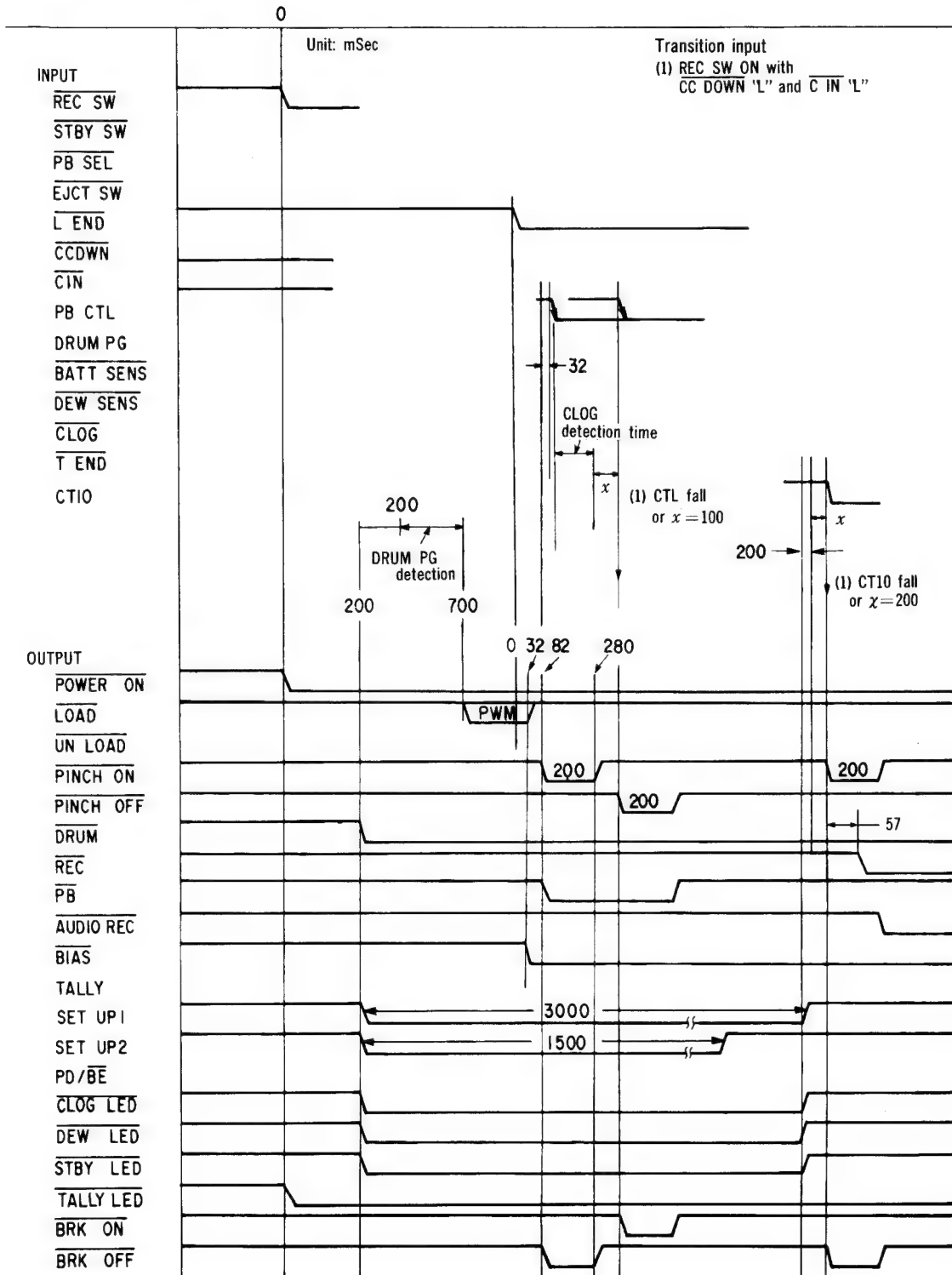
3-11-3. LOAD→UNLOAD→HOLDER UP TIMING CHART



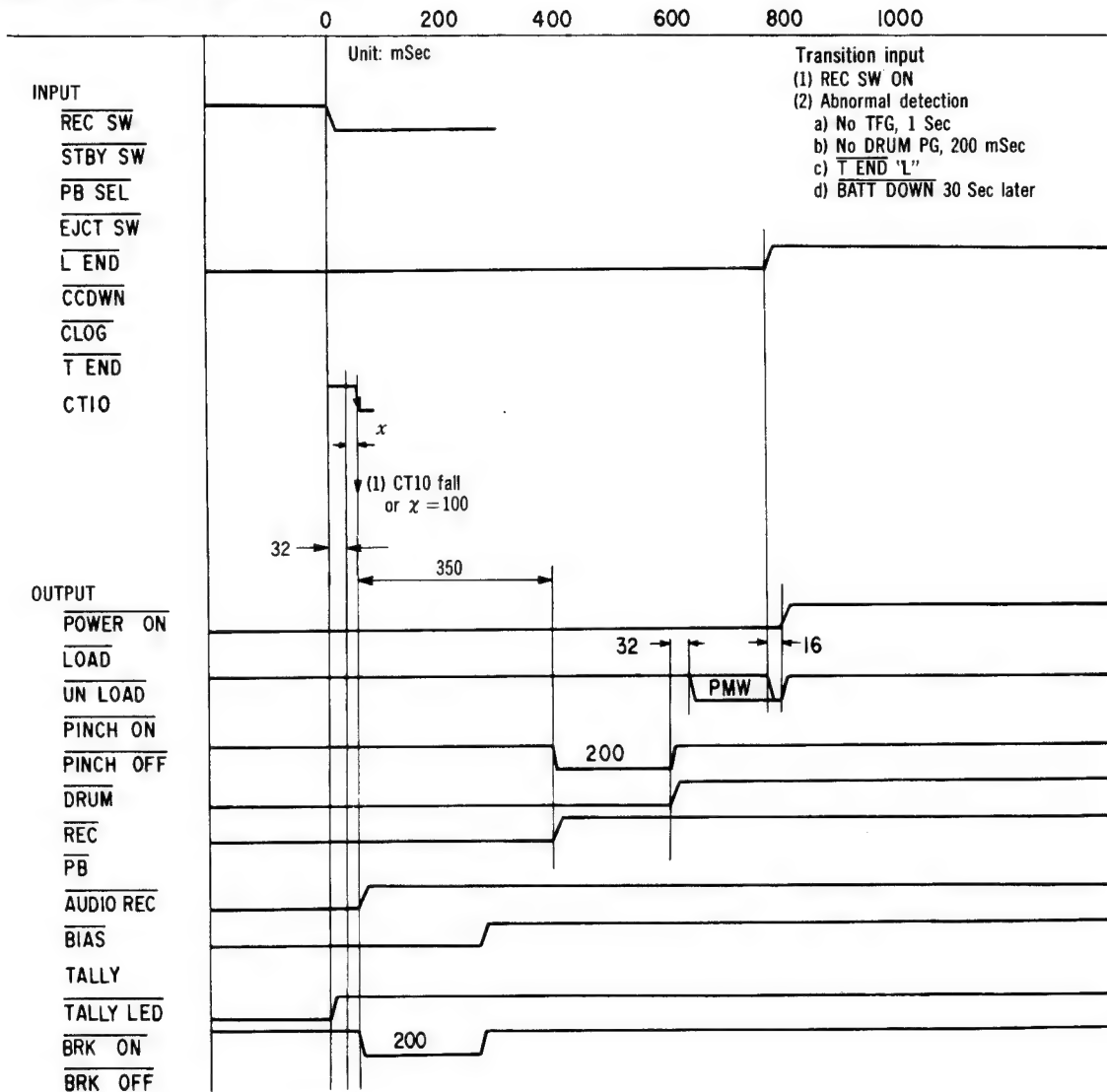
3-11-4. HOLDER DOWN→LOAD TIMING CHART



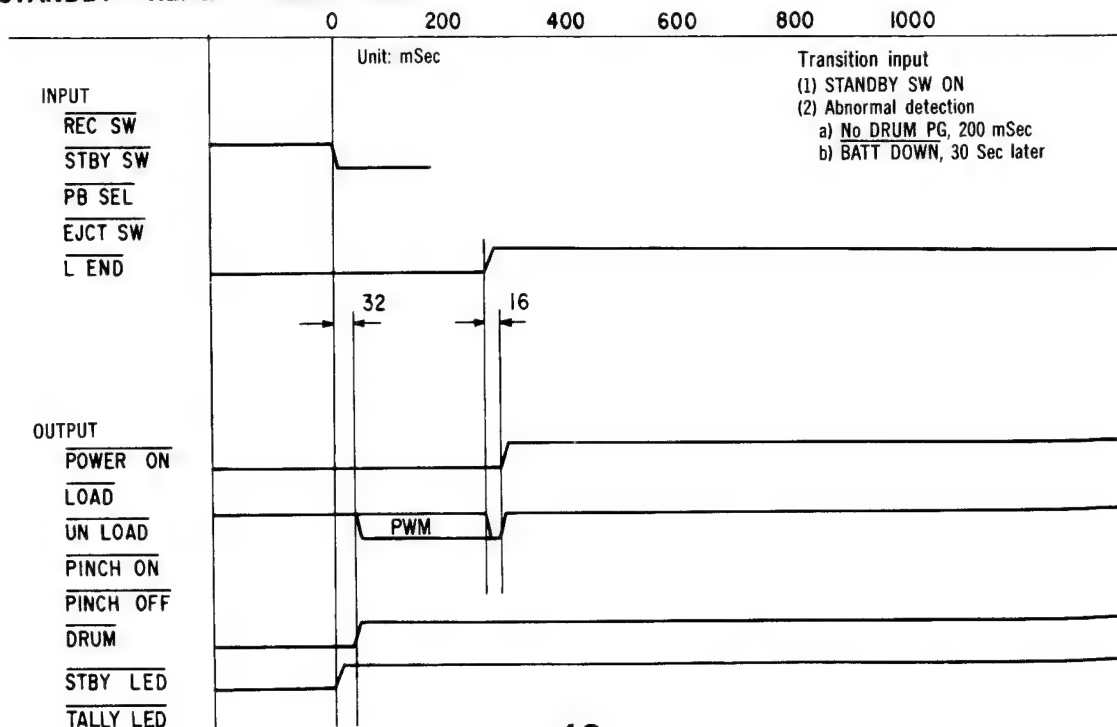
3-11-5. READY→REC TIMING CHART



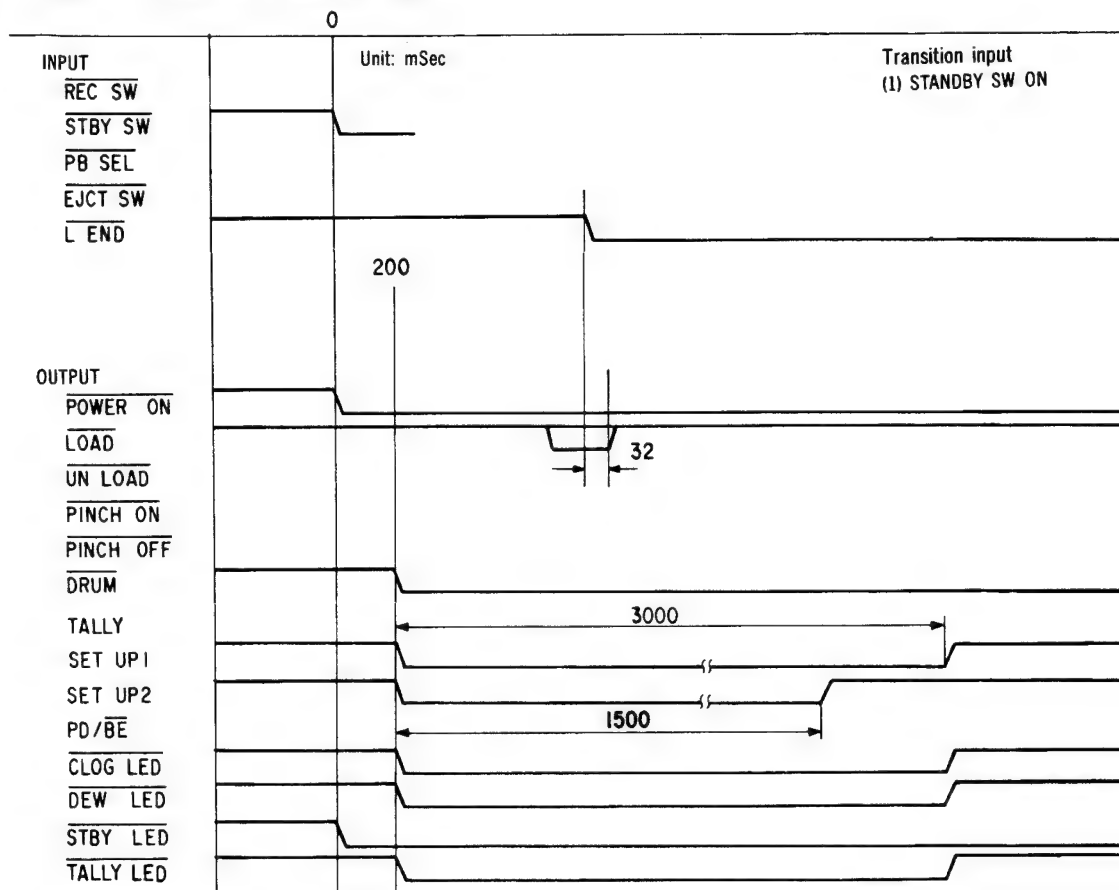
3-11-6. REC→READY TIMING CHART



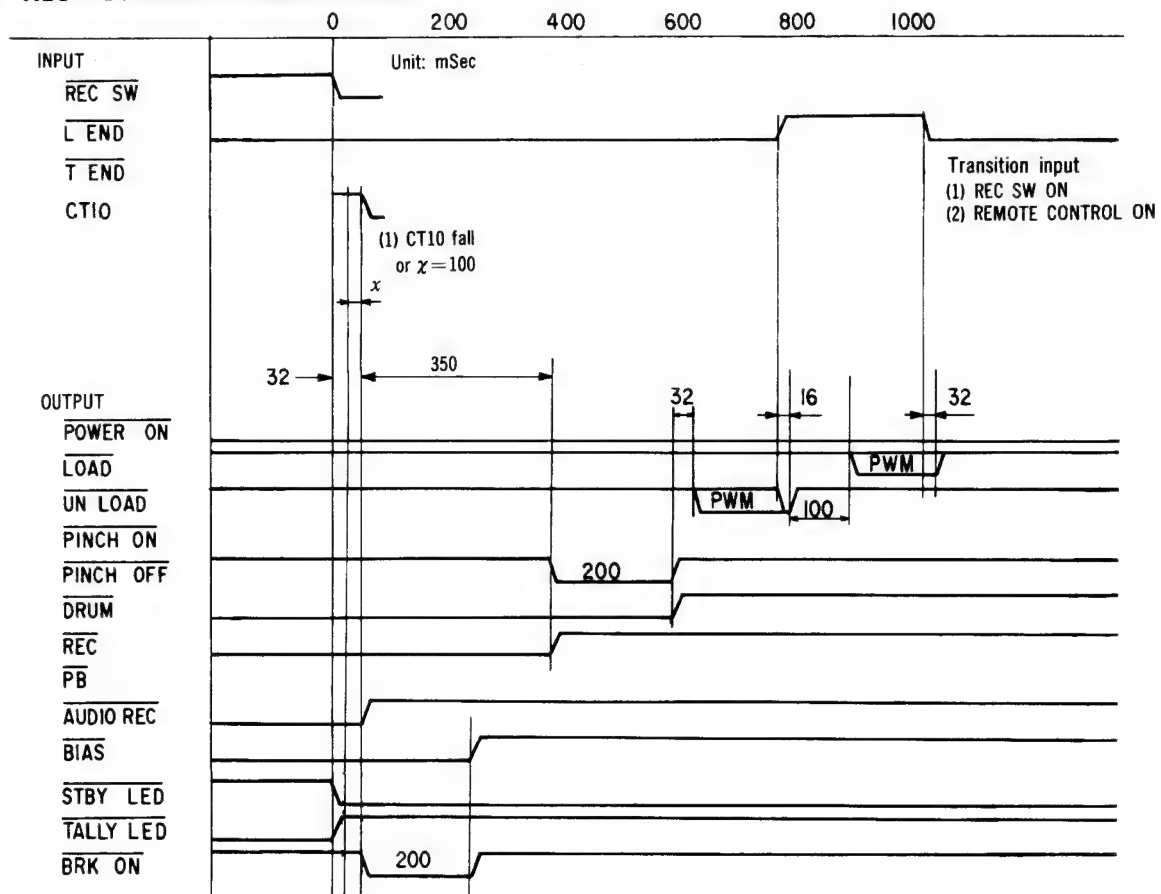
3-11-7. STANDBY→READY TIMING CHART



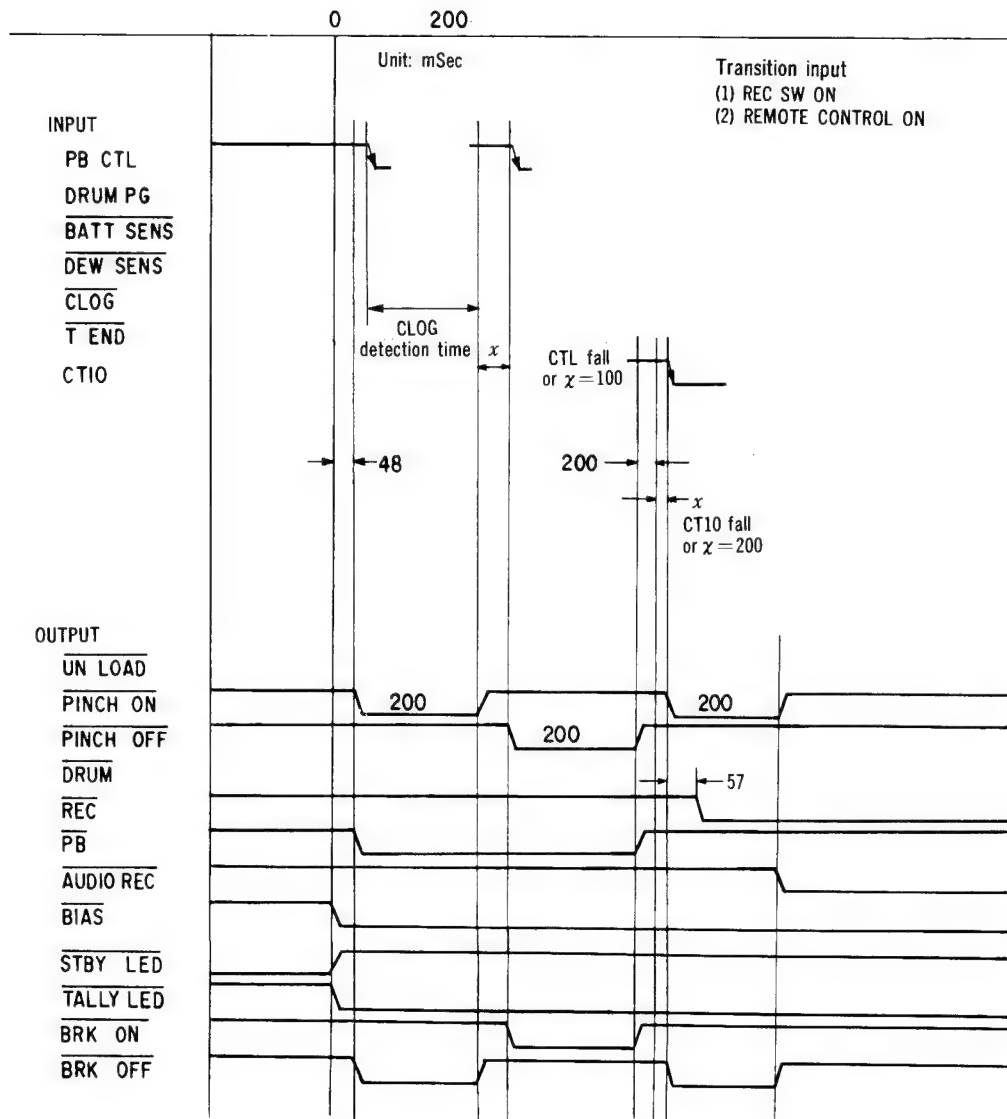
3-11-8. READY→STANDBY TIMING CHART



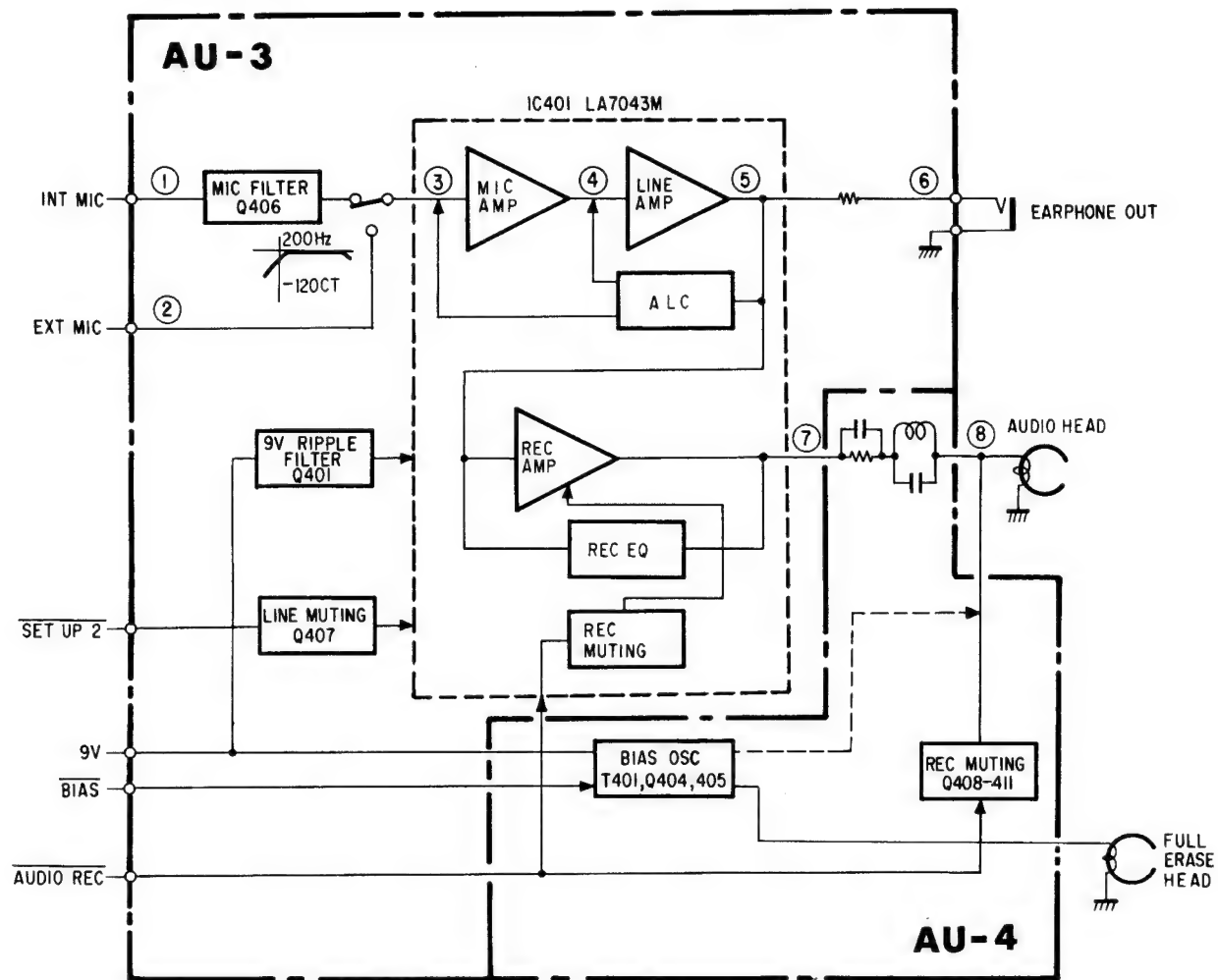
3-11-9. REC→STANDBY TIMING CHART



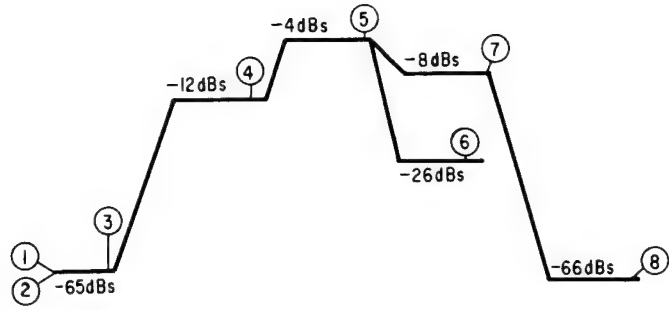
3-11-10. STANDBY → REC TIMING CHART



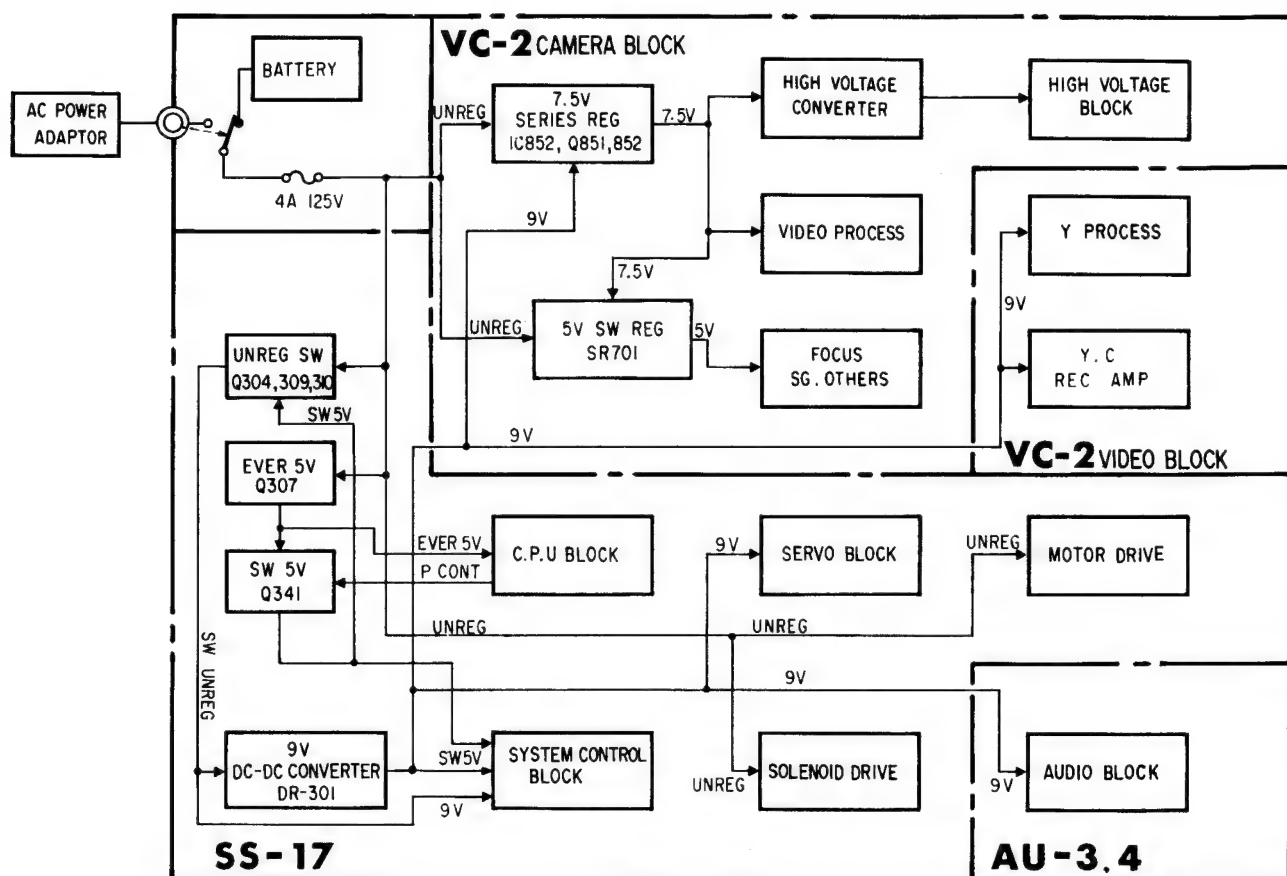
3-12. AUDIO BLOCK DIAGRAM



3-13. AUDIO LEVEL DIAGRAM



3-14. POWER SYSTEM BLOCK DIAGRAM



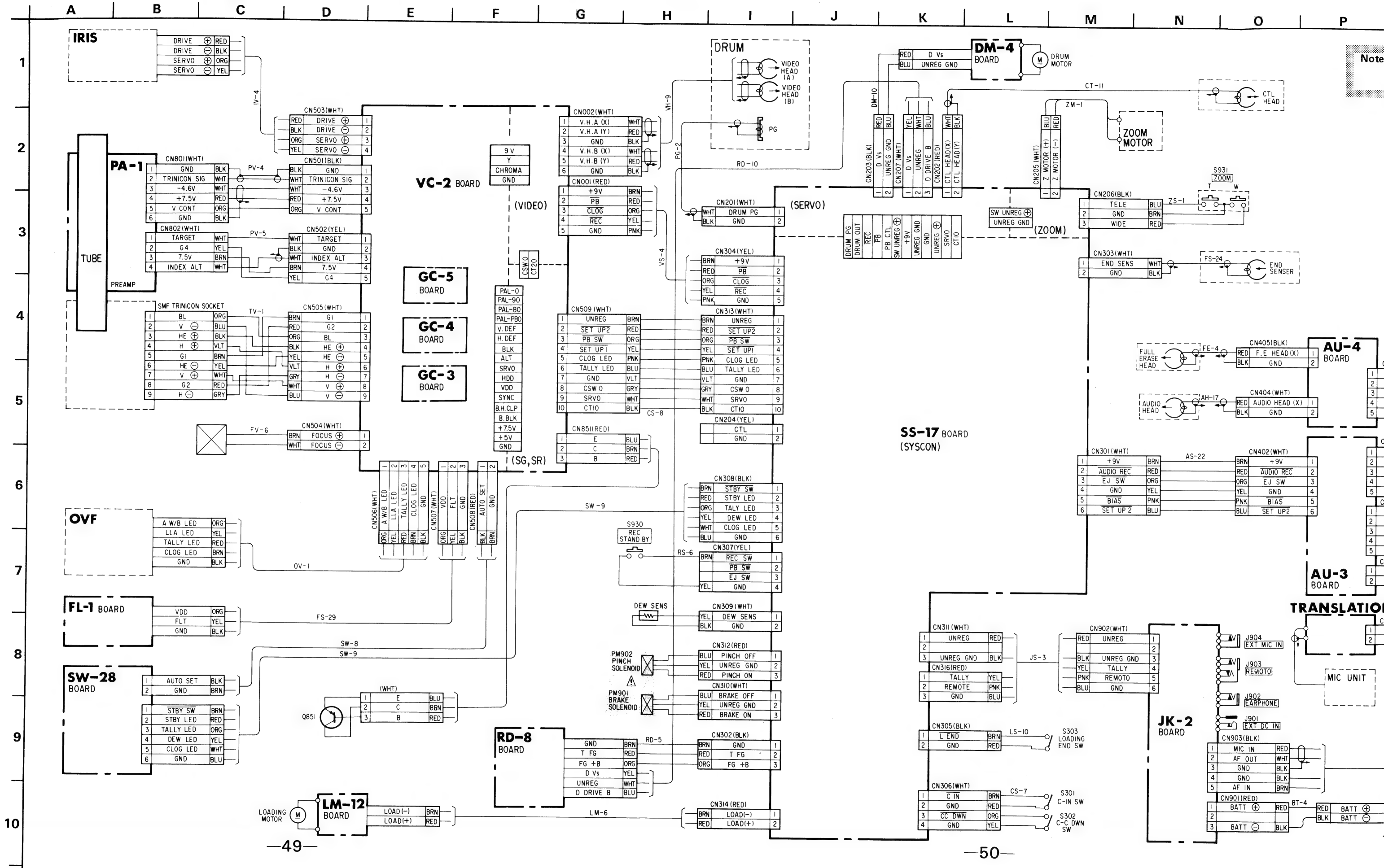
3-15. FUNCTION OF IC301 TERMINALS

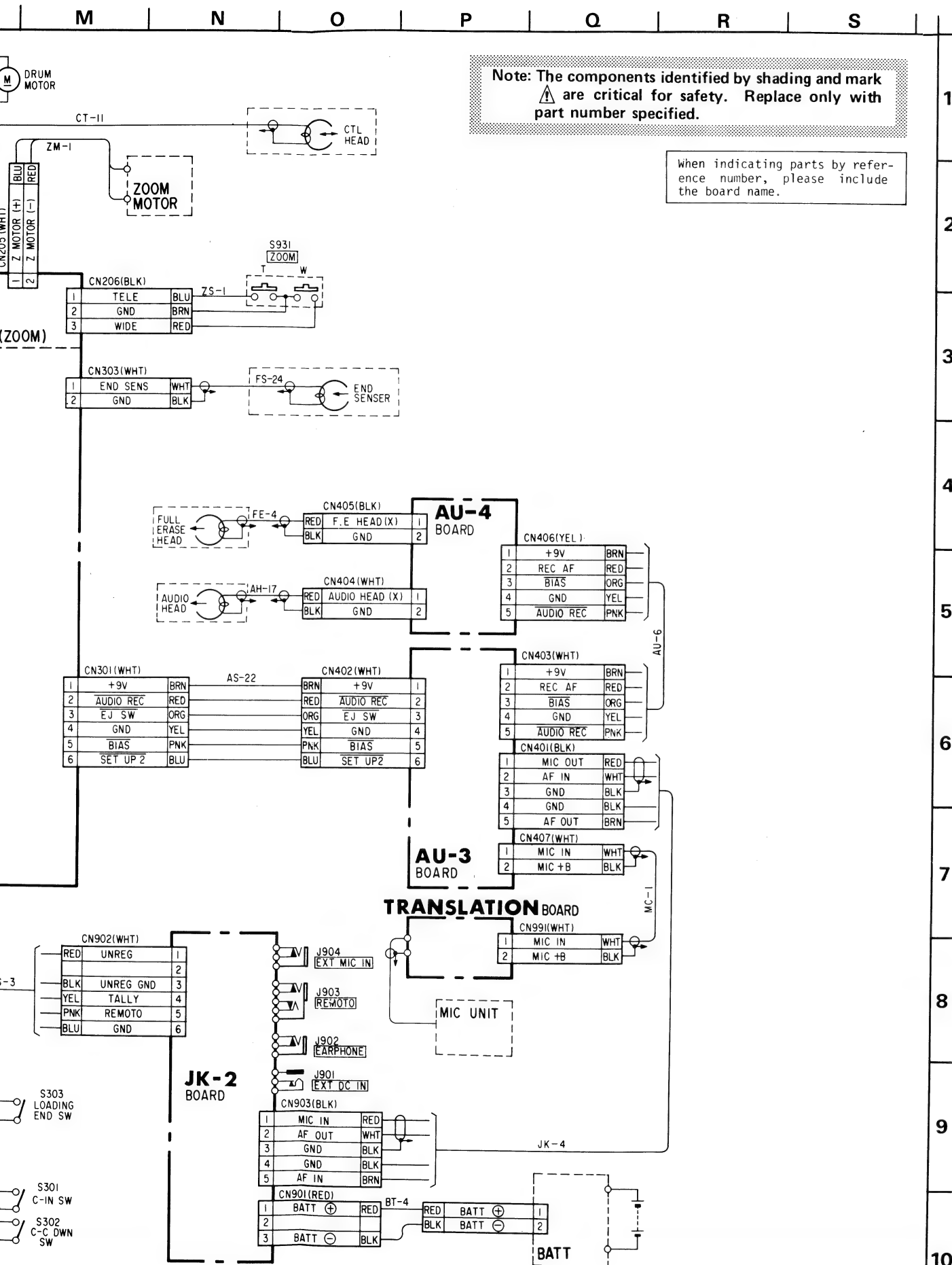
Terminal No.	Terminal name	I/O	Functions
1	PWCTRL	OUT	Turns on/off power supply circuit.
2	BIAS	OUT	Turns on/off audio recording bias circuit.
3	PINCH ON	OUT	Presses pinch roller against capstan. Pulse width of 200mS.
4	PINCH OFF	OUT	Separates pinch roller from capstan. Pulse width of 200mS.
5	BRAKE ON	OUT	Applies brake to reel base. Pulse width of 200mS.
6	BRAKE OFF	OUT	Releases brake from reel base. Pulse width of 200mS.
7	DEW LED	OUT	Turns on DEW LED.
8	STAND-BY LED	OUT	Turns on STANDBY LED.
9	TALLY LED	OUT	Turns on TALLY LED.
10	CLOG LED	OUT	Turns on CAUTION LED.
11			Not used.
12	PB	OUT	Operates PB amplifier for CLOG detection and for linked shooting.
13	REC	OUT	Operates CTR recording amplifier of picture recording circuit.
14	DRUM OUT	OUT	Turns on/off drum motor drive circuit.
15	SET UP 2	OUT	Performs beam blacking of camera tube for 1.5 second during shifting from READY to REC, STANDBY and PB.
16	START	IN	Trigger input for starting IC301. Inputs occur when each switch of REC and STANDBY EJECT C-IN is turned on and when PB SW becomes "L".
17			Not used.
18	+5V (VDD)		+5V power supply terminal.
19			Not used
20	DEW SENS	IN	Drum dew condensation input. Set is not operated during "L".
21	BAT DWN	IN	When power supply voltage decreases, "L" occurs and the operation of set is stopped.
22	RECSW/REMOTE	IN	Input of REC switch and remote control switch. When this input occurs, REC mode starts. Also, STANDBY and REC modes are switched every time there is an input.
23	STAND-BY SW	IN	Input of STANDBY switch. By this input, STANDBY and READY (stop) modes are switched.
24	DRUM PG	IN	PG signal input by which whether the drum is normally rotated or not is checked.
25	CLOG DET	IN	Whether the normal picture recording is being made or not is applied to this terminal. Whether the picture recording is normal or not is checked during linked shooting.
26	TFG	IN	FG of reel base rotation at T side is entered. If FG input is abnormal, set is stopped.
27	TAPE END	IN	If the oscillation of TAPE END detection-oscillation circuit stops, then "L" is applied to this terminal and the set is stopped.
28	PB SW	IN	If this terminal is set to "L", then the set will have PB mode.
29	AUDIO REC	OUT	Operates audio sound recording circuit.
30			Not used.
31	SET UP 1	OUT	Pulses of 3 seconds are delivered when shifting from READY to REC, STANDBY and PB, during which the set performs no operation. This output also turns on LEDs of WHITE BALANCE and LOW LIGHT. 3 seconds is mainly used for the rise of heater of picture tube.
32	EJECT SW	IN	Cassette is ejected by this input.
33	C-IN SW	IN	Input terminal of switch which detects the entry of a cassette. This switch also detects the claw for preventing picture recording of cassette and thus has the function to prevent picture recording.
34	L END	IN	Input terminal for detecting the completion of loading.
35	CSWO	IN	Input for distinguishing the output of A-head from the output of B-head during CLOG detection.
36	X'tal IN	IN	Terminal for connecting clock oscillation element.
37	X'tal OUT	OUT	Terminal for connecting clock oscillation element.
38	RESET	IN	Trigger input of IC031 reset circuit.
39	PBCTL	IN	Input for taking pinch-off timing during linked shooting.
40	CTIO	IN	Input for taking REC start timing during linked shooting.
41			Not used.
42	GND		Earth terminal
43			Not used.
44	BE/PD	OUT	Delivers "L" when the battery voltage is lower than $9.15 \pm 0.1V$.
45	CC DOWN SW	IN	Detects a failure of cassette control.
46			Not used.
47	LOAD	OUT	Output for performing the loading (pulse drive).
48	UN LOAD	OUT	Output for performing unloading (pulse drive).

3-16. FUNCTION OF IC851 TERMINALS

Terminal No.	Terminal name	I/O	Functions
1	TST1	IN	Input for measurement, normally fixed to 'H'.
2	TST2	IN	Input for measurement, normally fixed to 'H'.
3			Not used.
4	TST3	IN	Input for measurement, normally fixed to 'H'.
5	PPM0	OUT	PAL carrier color signal, $f_{sc} = (44 \pm 1/8) \cdot f_H$
6	V _{ss}		0V
7	PM90	OUT	PAL carrier color signal, -90° signal for PPM0.
8	XRST	IN	External reset input, normally fixed to 'H'.
9	PBO	OUT	Burst signal of PAL.
10	PPBO	OUT	Pilot burst signal of PAL.
11	FID	OUT	Frame ID signal of SECAM.
12	VID	OUT	Field ID signal of SECAM.
13	PPBF	OUT	Pilot burst flag signal of PAL.
14	DEVD	OUT	Deflection VD signal.
15	DEHD	OUT	Deflection HD signal.
16	BMCL	OUT	Black mask clamp signal.
17	BBLK	OUT	Beam blanking signal.
18	VDO	OUT	Vertical drive signal.
19	V _{DD}		+5V
20	HDO	OUT	Horizontal drive signal.
21	SYNC	OUT	Composite sync signal.
22	BLKO	OUT	Composite blanking signal of PAL.
23	BFO	OUT	Color burst flag signal of PAL.
24			Not used.
25	PALT	OUT	Line alternation signal of PAL.
26	XPAL	OUT	Inverted signal of PALT.
27	SALT	OUT	Line alternation signal of SECAM.
28	SCBL	OUT	Color blanking signal of SECAM.
29	SHBL	OUT	Horizontal blanking signal of SECAM.
30	CSWO	OUT	Video head switching signal for CLOG detection.
31	V _{ss}		0V
32	CT10	OUT	CTL recording signal.
33	CT20	OUT	Video head switching signal for recording.
34	SRVO	OUT	Servo signal.
35	FLM2	OUT	Frame alternation signal.
36	KVID	IN	Controls whether the field ID portion of SCBL is to be sent out or not.
37	X1I	IN	$702 \cdot f_H$ in
38	X1O	OUT	$702 \cdot f_H$ out
39	X2O	OUT	$706 \cdot f_H$ out
40	X2PD	OUT	Phase detector output signal.
41	X2I	IN	$706 \cdot f_H$ in
42			Not used.
43	V _{DD}		+5V
44			Not used.
45			Not used.
46			Not used.
47			Not used.
48			Not used.

SECTION 4
SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS
4-1. FRAME SCHEMATIC DIAGRAM



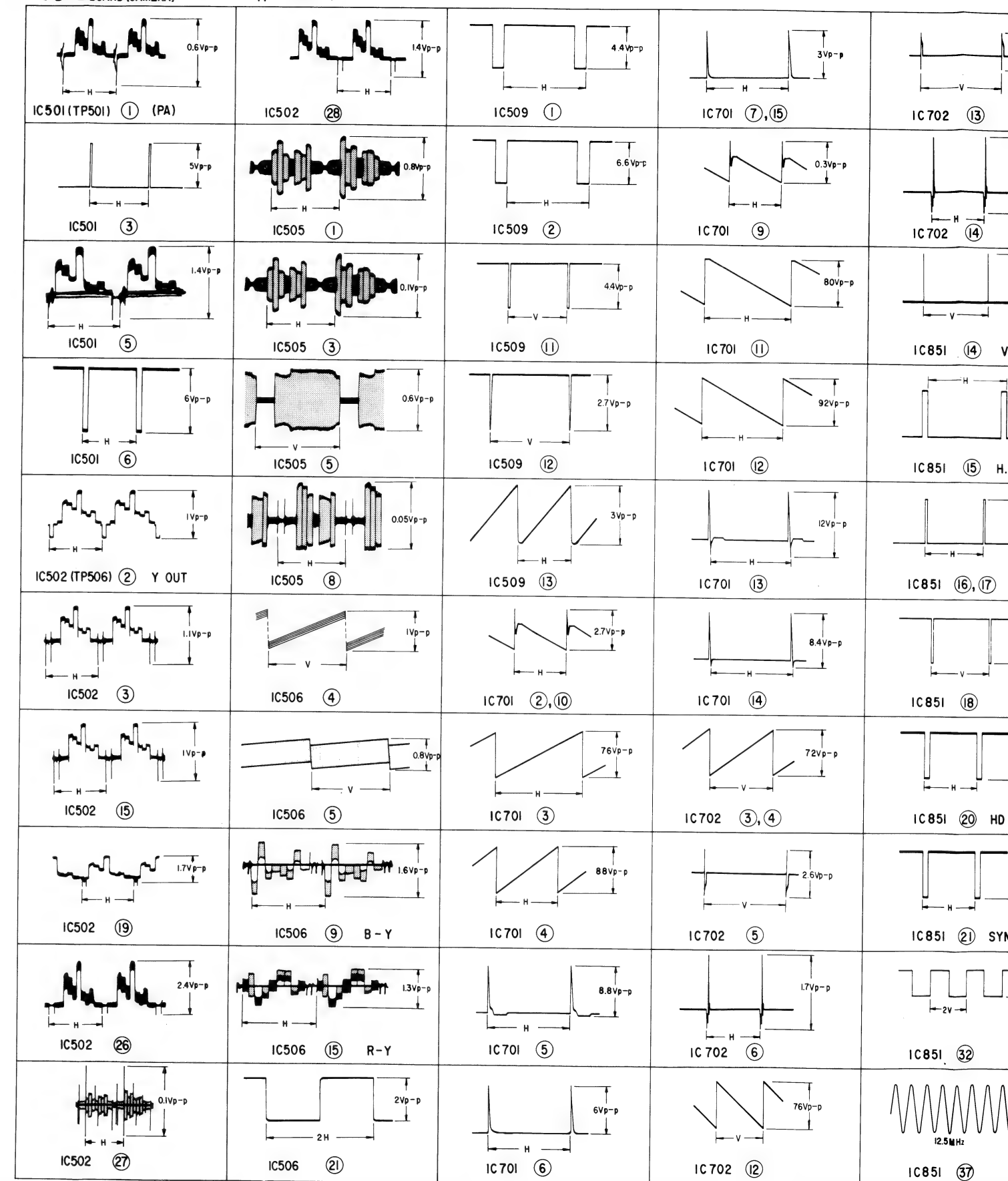


CAMERA CAMERA

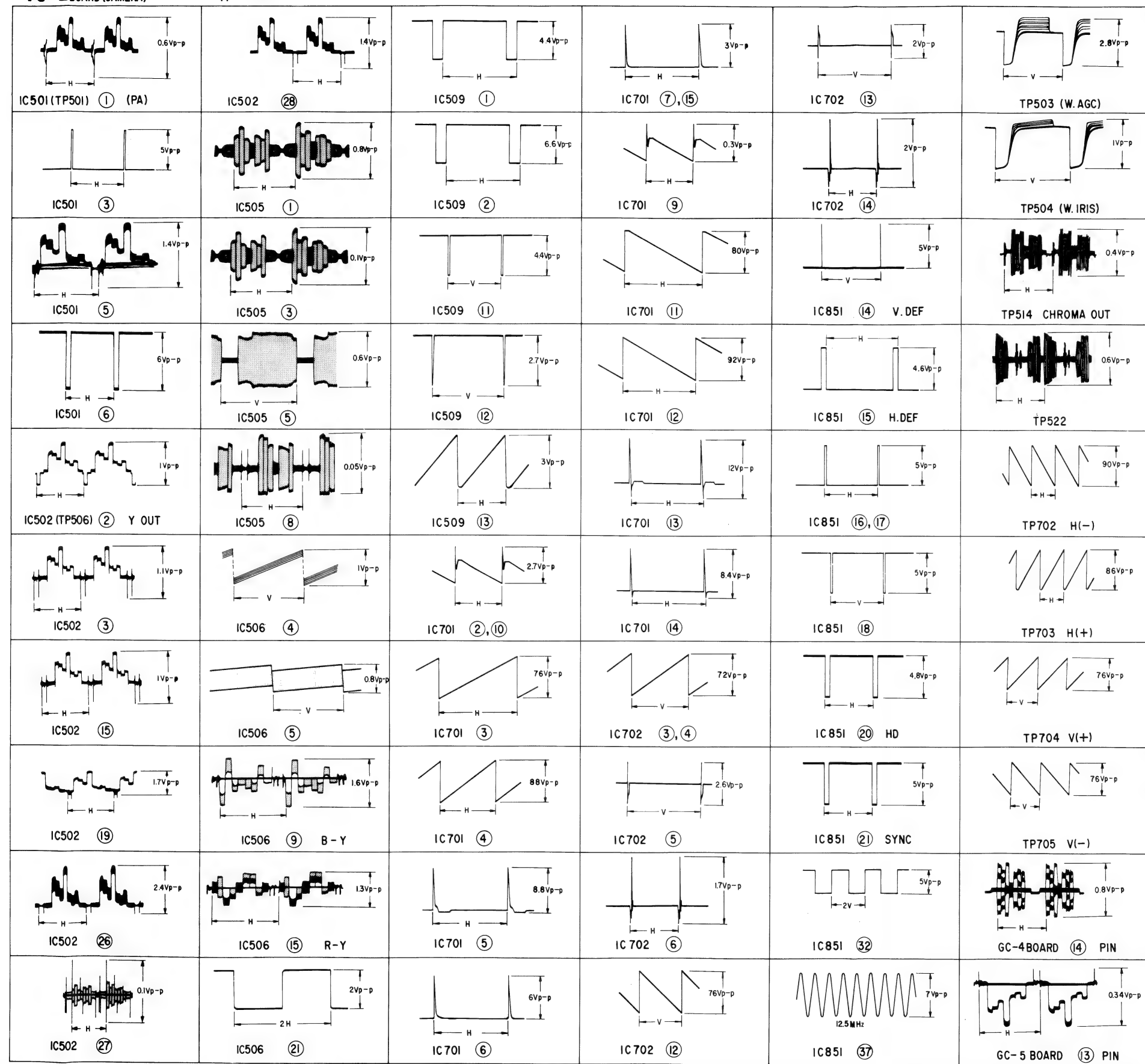
WAVEFORMS

VC-2 BOARD (CAMERA)

H: 1.2f_H (18.9kHz)




WAVEFORMS

VC-2 BOARD (CAMERA) H: 1.2f_H (18.9kHz)






S

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se include

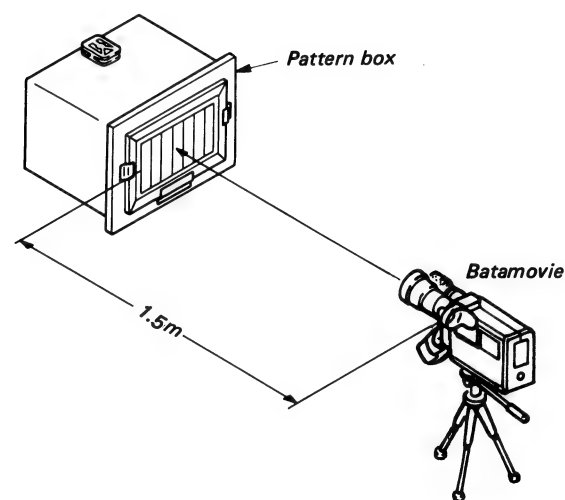
Note: The components identified by shading and mark  are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

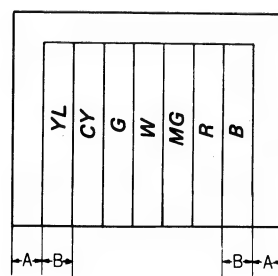
Note:

- Caution when replacing tip parts.
New parts must be attached after removal of tip.
Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, $\frac{1}{10}W$ unless otherwise noted.
 $k\Omega$: 1000 Ω , $M\Omega$: 1000 $k\Omega$
- All capacitors are in μF unless otherwise noted. pF : μF
50WV or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
-  : panel designation.
-  : Through hole.
-  : nonflammable resistor.
-  : B+ bus.
-  : adjustment for repair.
- Voltage and waveform measuring conditions:
(1) Sample object: Pattern box color bars.
(2) Voltage values: Relative to ground, measured with a DC digital multimeter (impedance 10M-ohm or more).

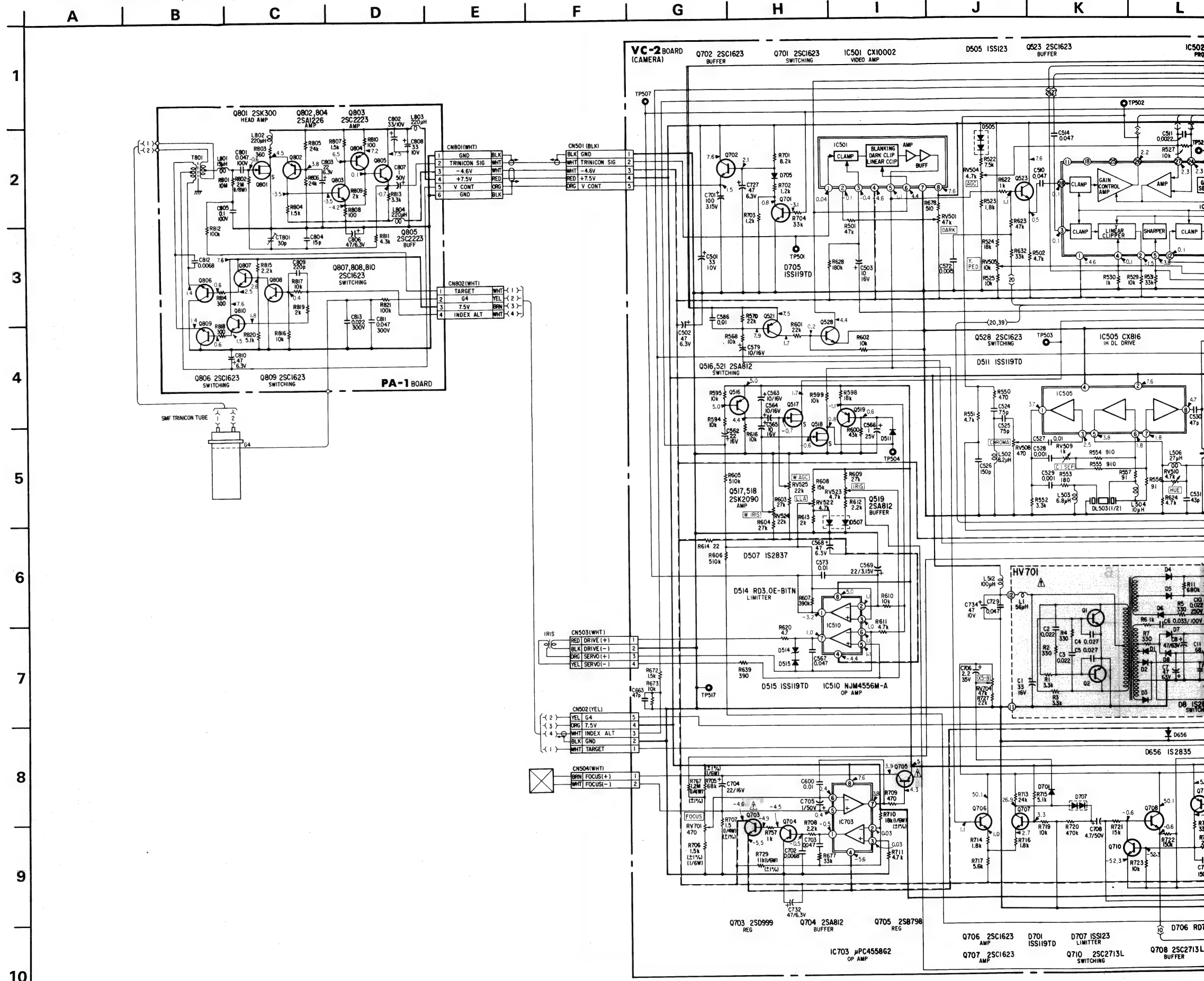
1. Connection



2. Shoot the subject so that the picture frame on the monitor is as shown in the figure below.



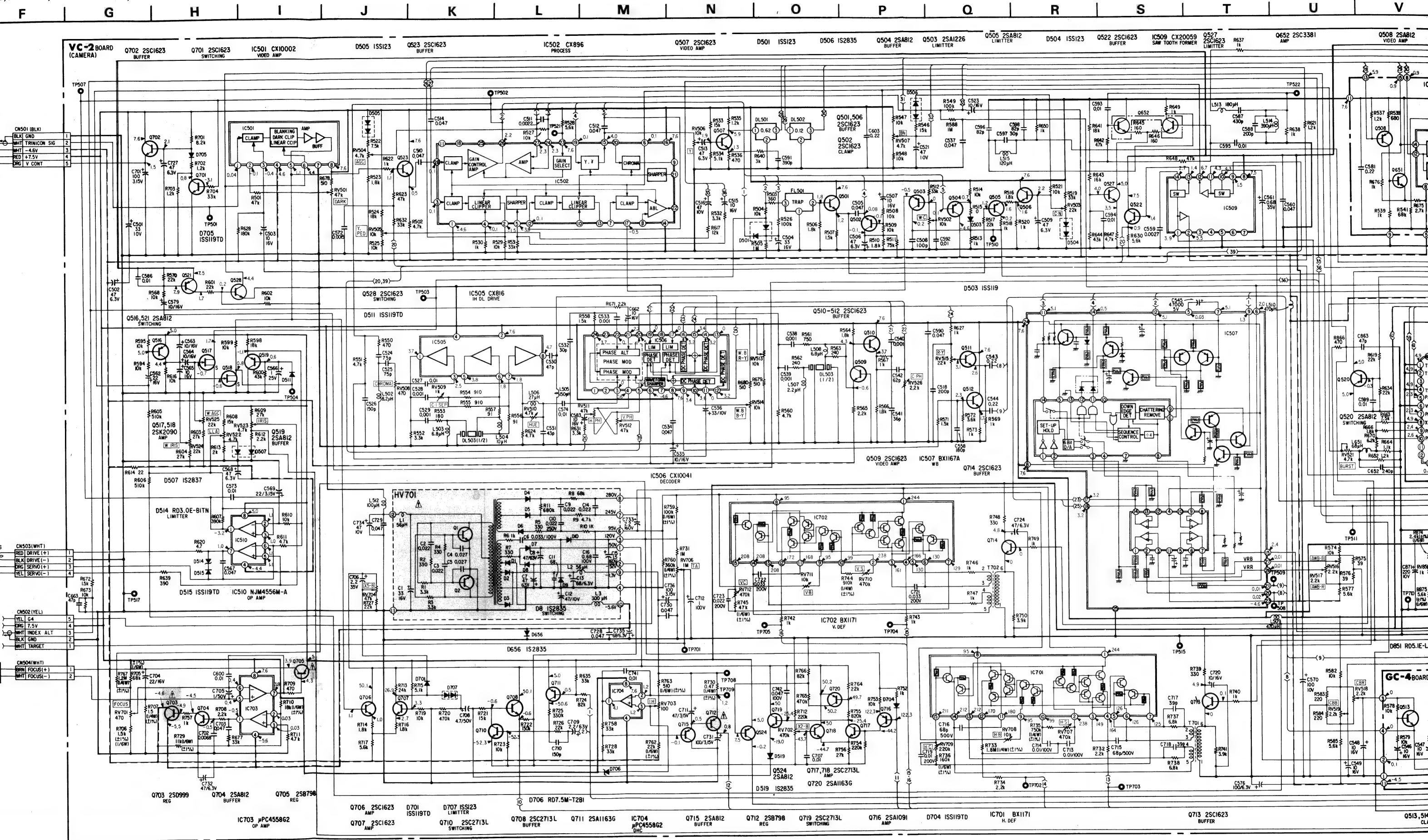
PA-1 (PRE AMP), VC-2 (Y & CHROMA SIGNAL PROCESS), GC-3 (OSCILLATOR), GC-4 (MODULATOR), GC-5 (DELAY), FL-1 (FILTER SWITCH) SCHEMATIC DIAGRAM
 - Ref. No. PA-1 BOARD : 2,000 series, VC-2 BOARD, GC-3 BOARD, GC-4 BOARD, GC-5 BOARD : 1,000 series, FL-1 BOARD : 4,500 series -

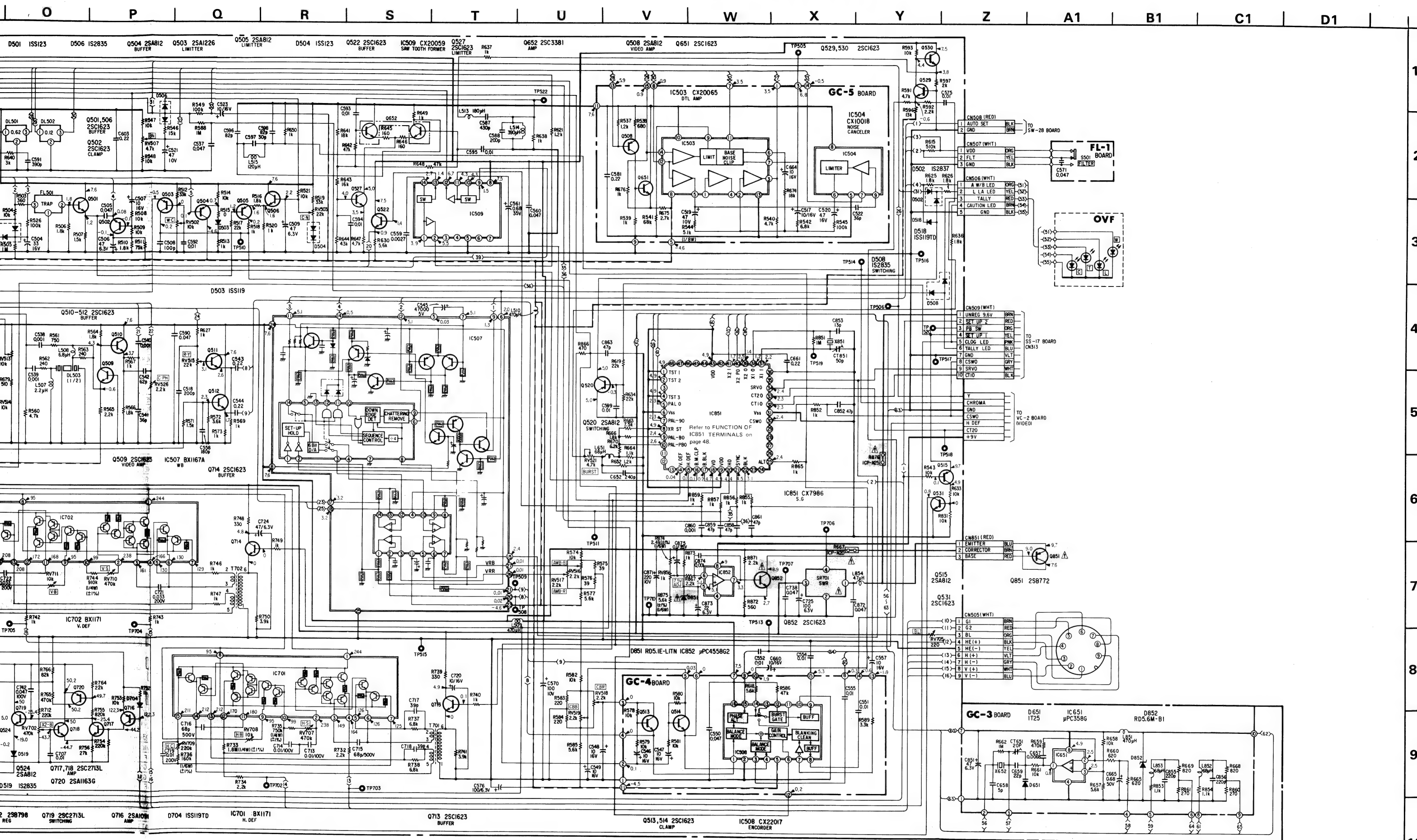


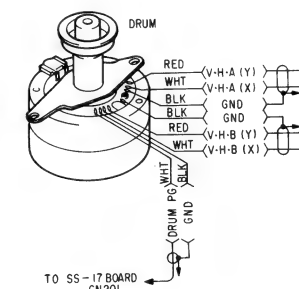
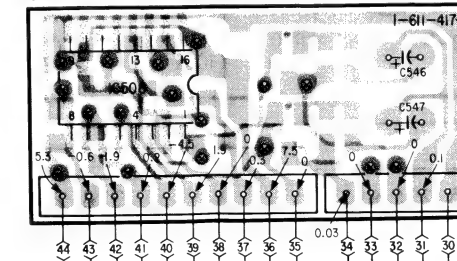
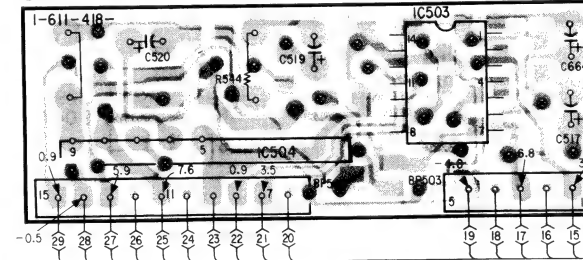
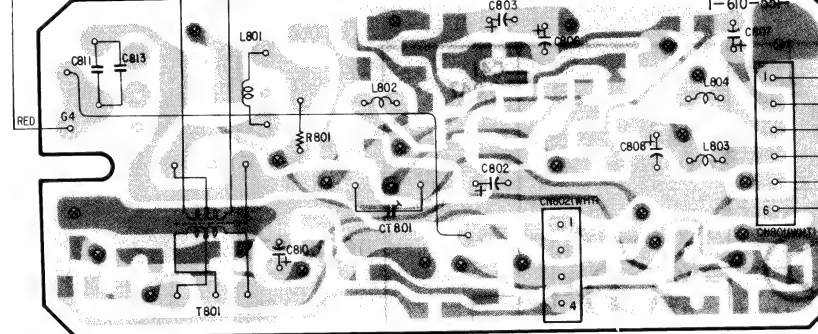
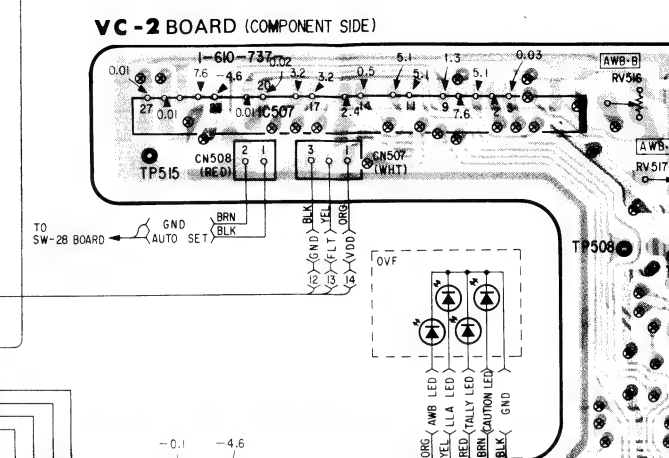
CAMERA CAMERA

), GC-4 (MODULATOR), GC-5 (DELAY), FL-1 (FILTER SWITCH) SCHEMATIC DIAGRAM

1,000 series, FL-1 BOARD : 4,500 series -

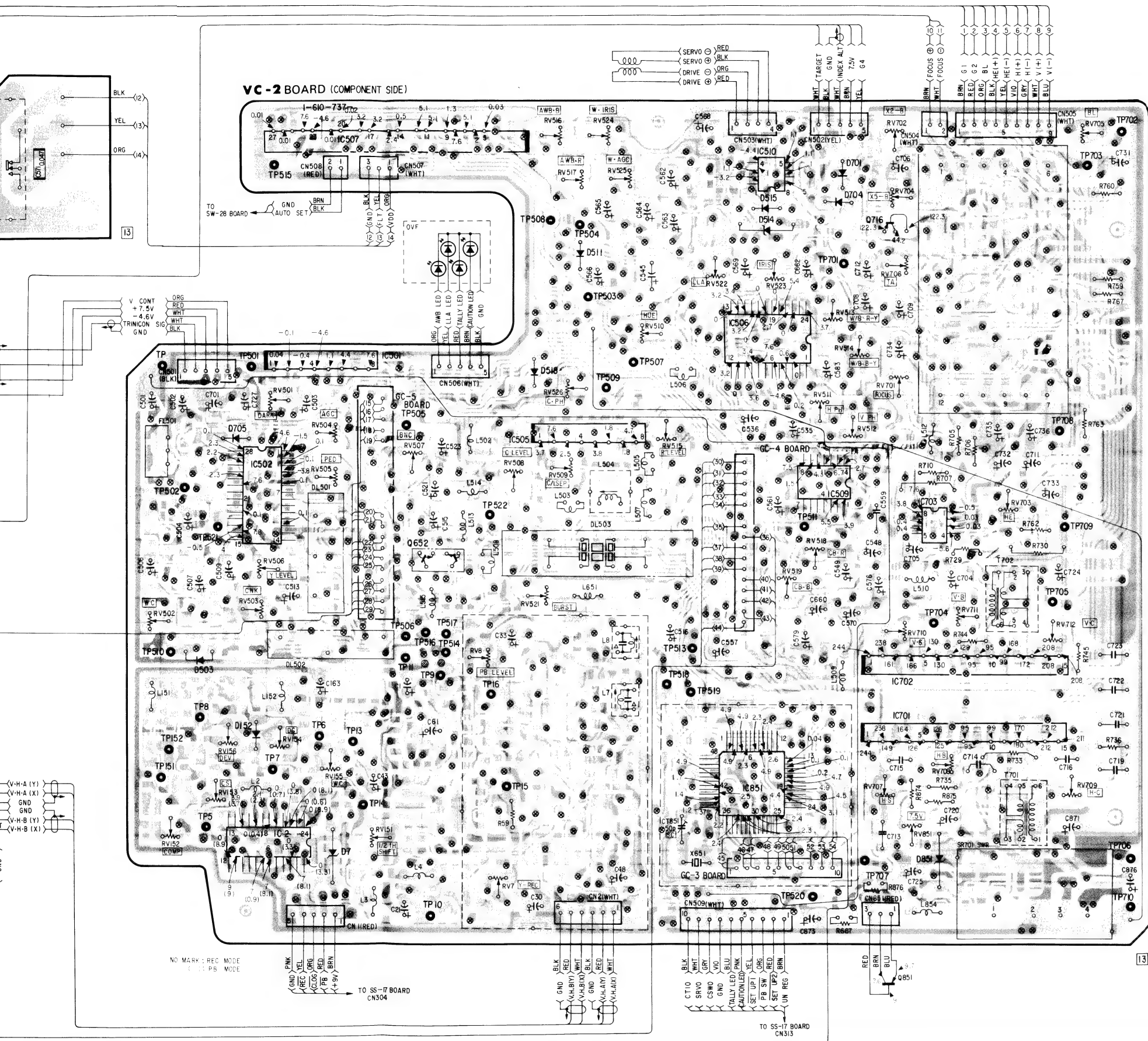




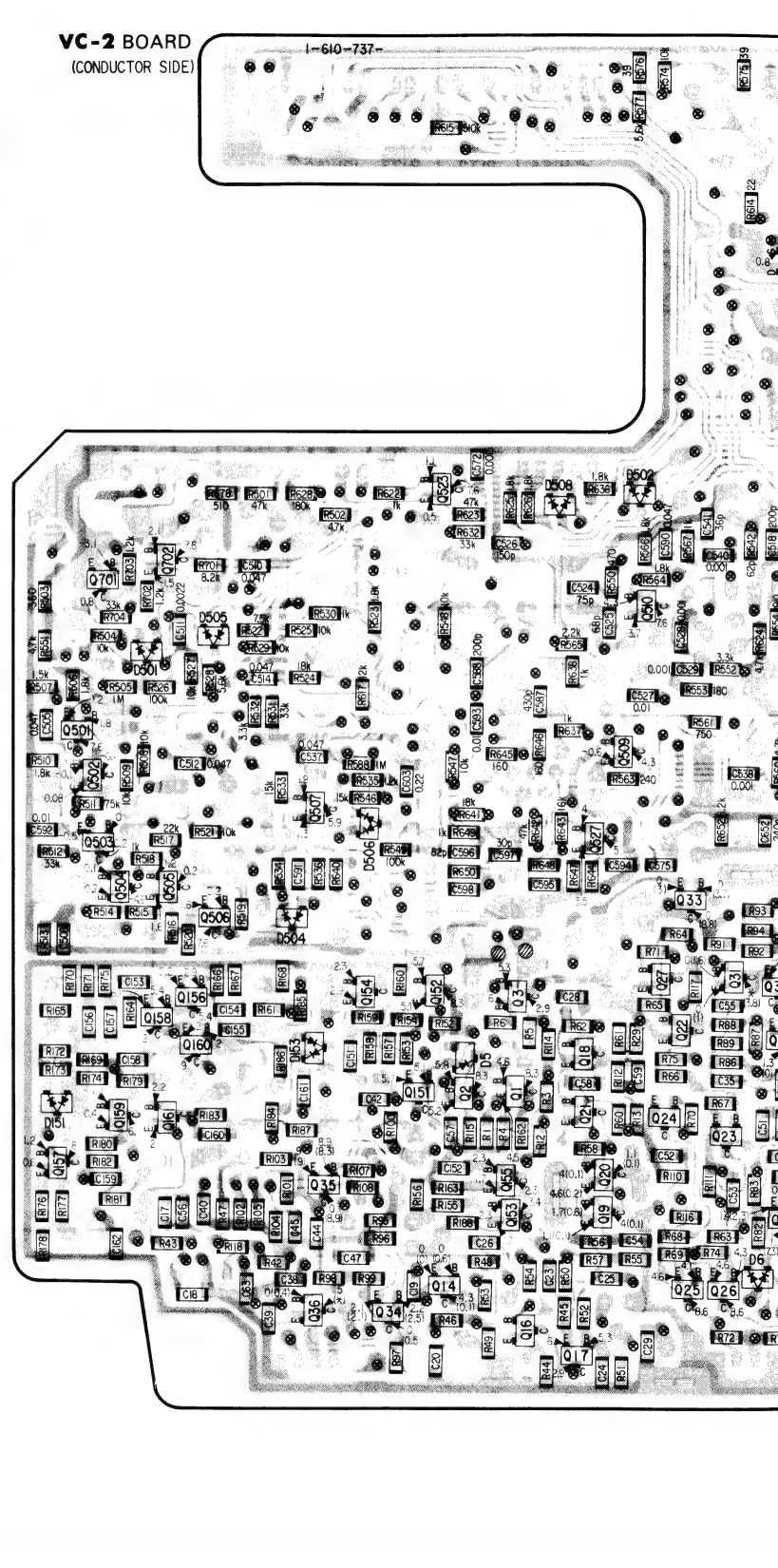


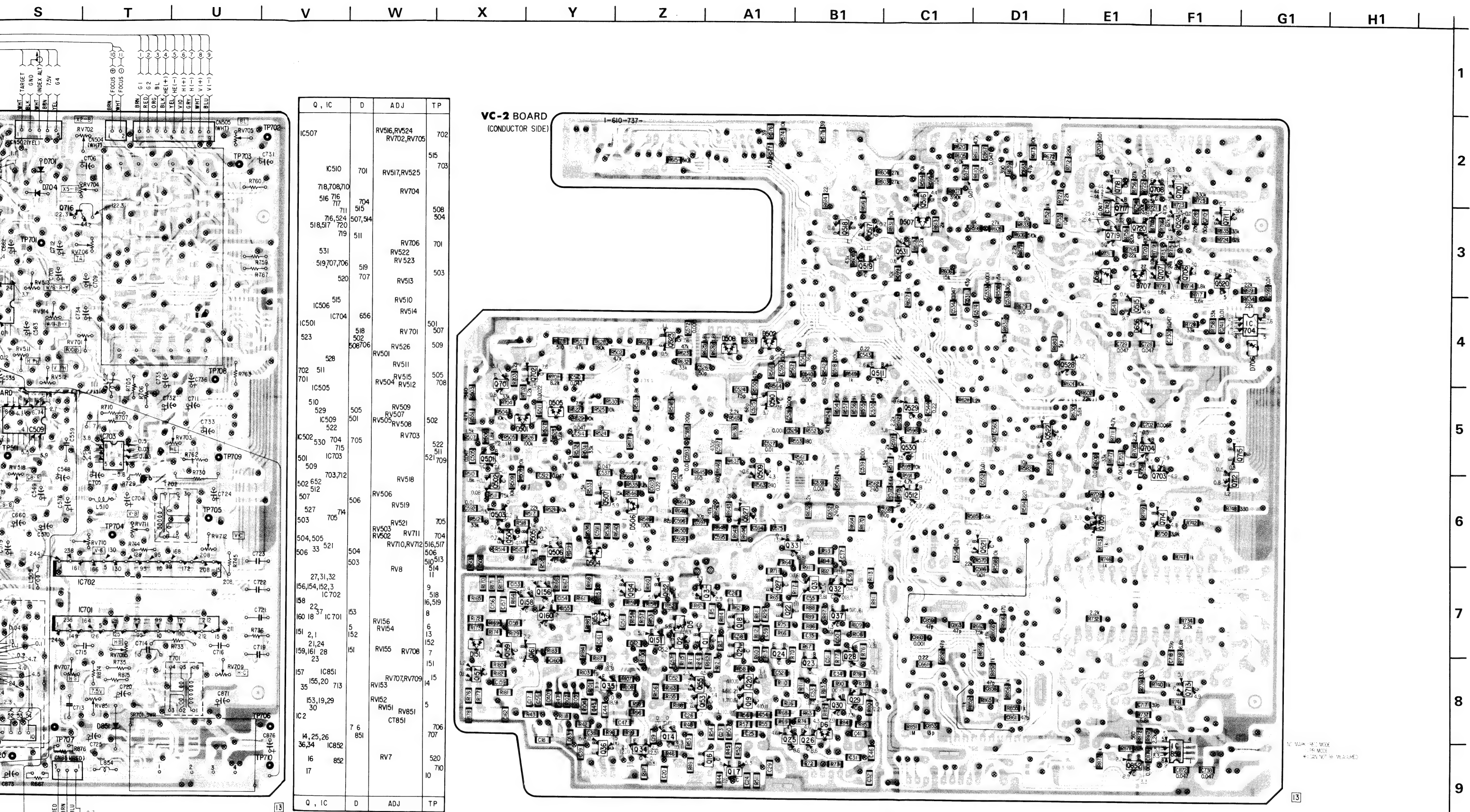
When indicating parts by reference number, please include the board name.

L M N O P Q R S T U V W X Y Z A1 B1



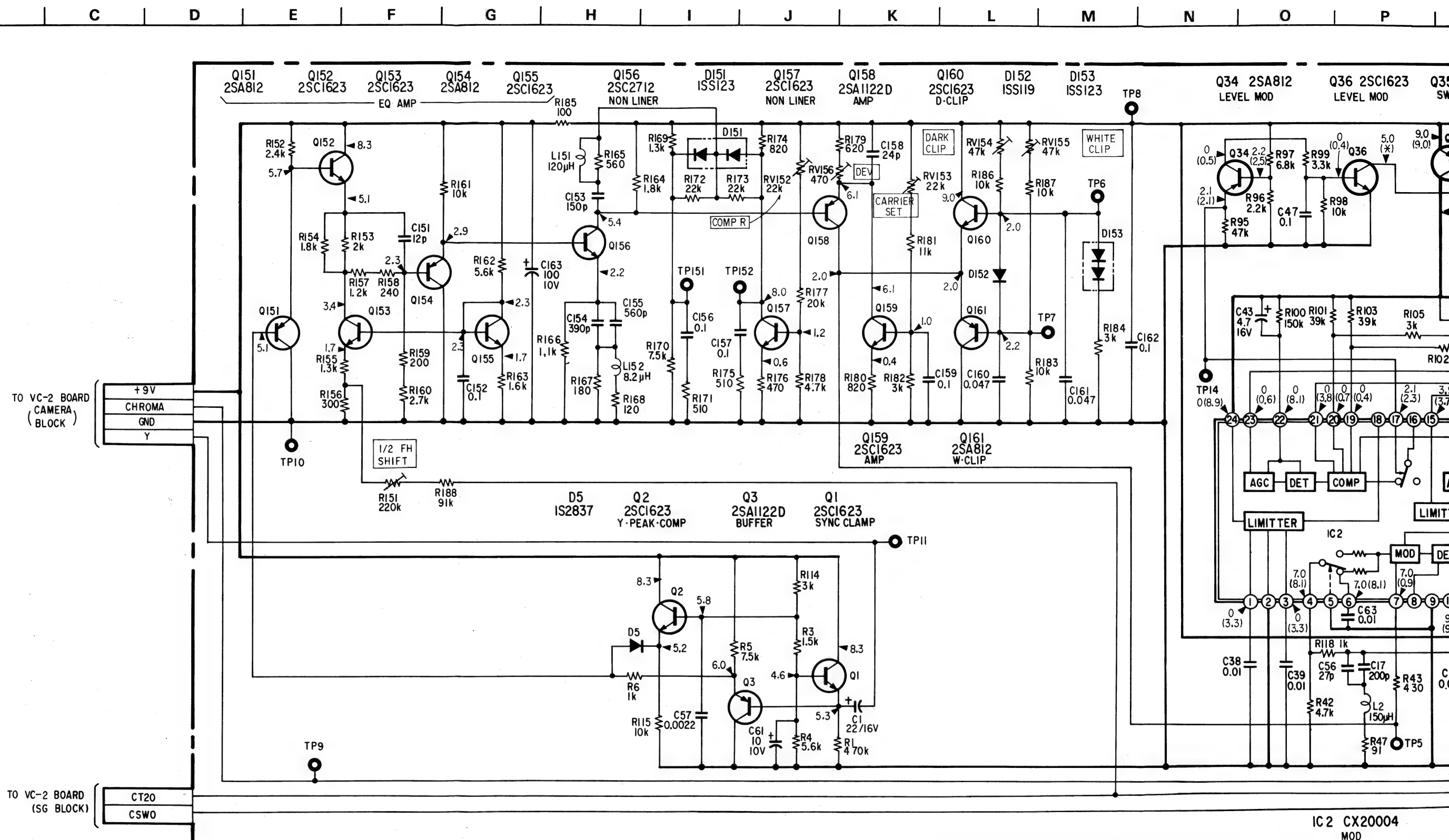
Q, IC	D	ADJ	TP
IC507	RV516, RV524 RV702, RV705		702
			515
IC510	RV517, RV525		703
718, 708, 710			
516 716	RV704		508
711			504
716, 524			
518, 517	RV706		701
719	RV522		
531	RV523		503
519, 707, 706	RV513		
520			
IC506	RV510		501
IC704	RV514		
IC501			507
523	RV701		509
	RV526		
528	RV511		
702 511	RV515		505
701	RV504		708
IC505	RV512		
510			
529	RV509		
IC509	RV505		502
522	RV508		
IC502	RV703		
530 704			522
715			511
501			521
509			709
502 652	RV518		
512	RV506		
507			
527	RV519		
503 705	RV521		705
504, 505	RV503		
506 33	RV502		704
521	RV710, RV712		516, 517
504			506
503	RV8		510, 513
			514
27, 31, 32			9
156, 154, 152, 3			518
IC702			16, 519
158			8
160 18	RV156		6
IC701	RV154		13
151			152
2, 1	RV155		7
159, 161	RV708		151
23			
157	RV707, RV709		15
IC851	RV153		14
35			
153, 19, 29	RV151		5
30	RV851		
IC2	CT851		706
			707
14, 25, 26			
36, 34	RV7		520
16			710
17			10

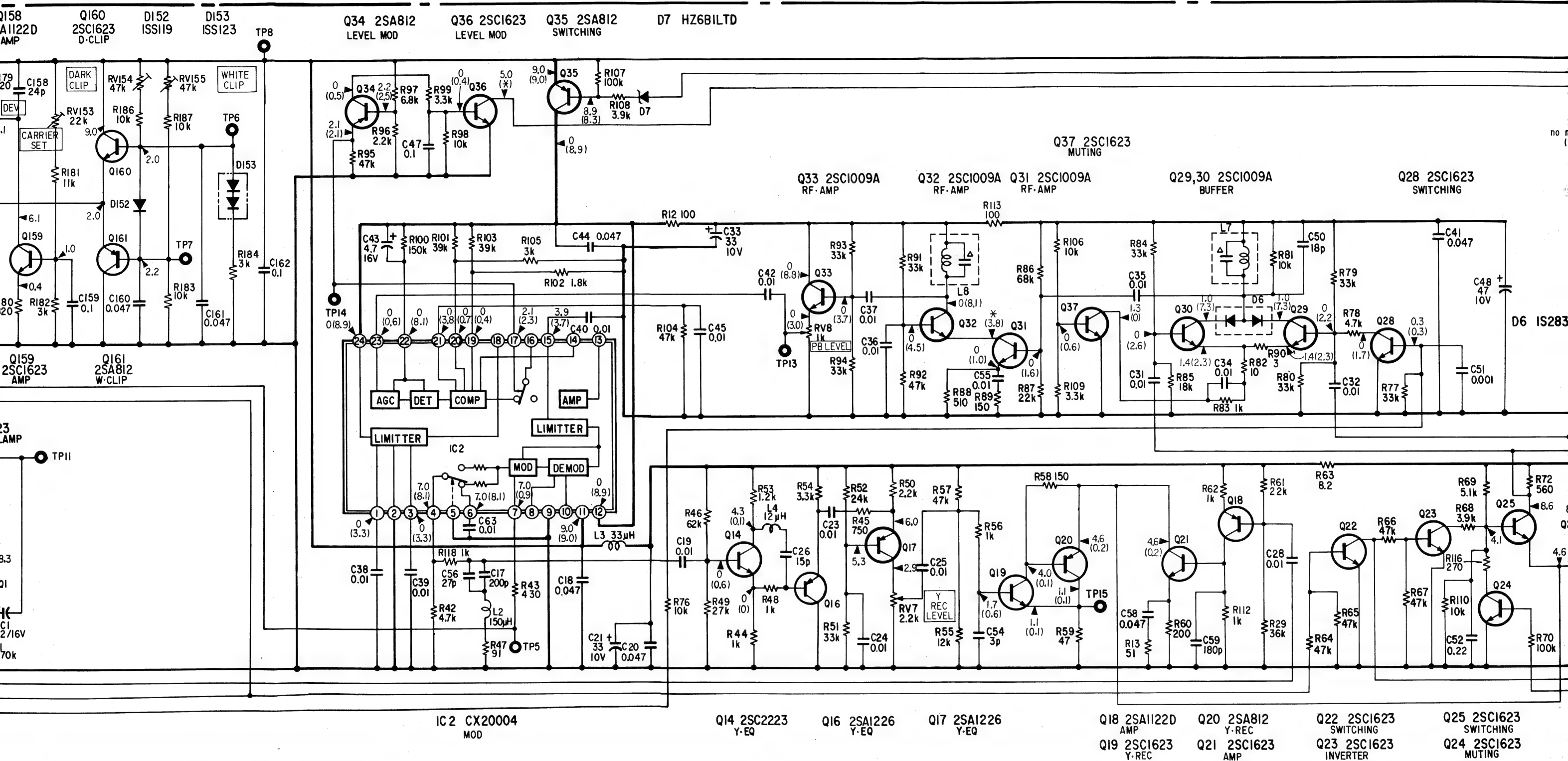




VC-2 (Y & CHROMA SIGNALS PROCESS) SCHEMATIC DIAGRAM

- Ref. No. VC-2 BOARD : 1,000 series -



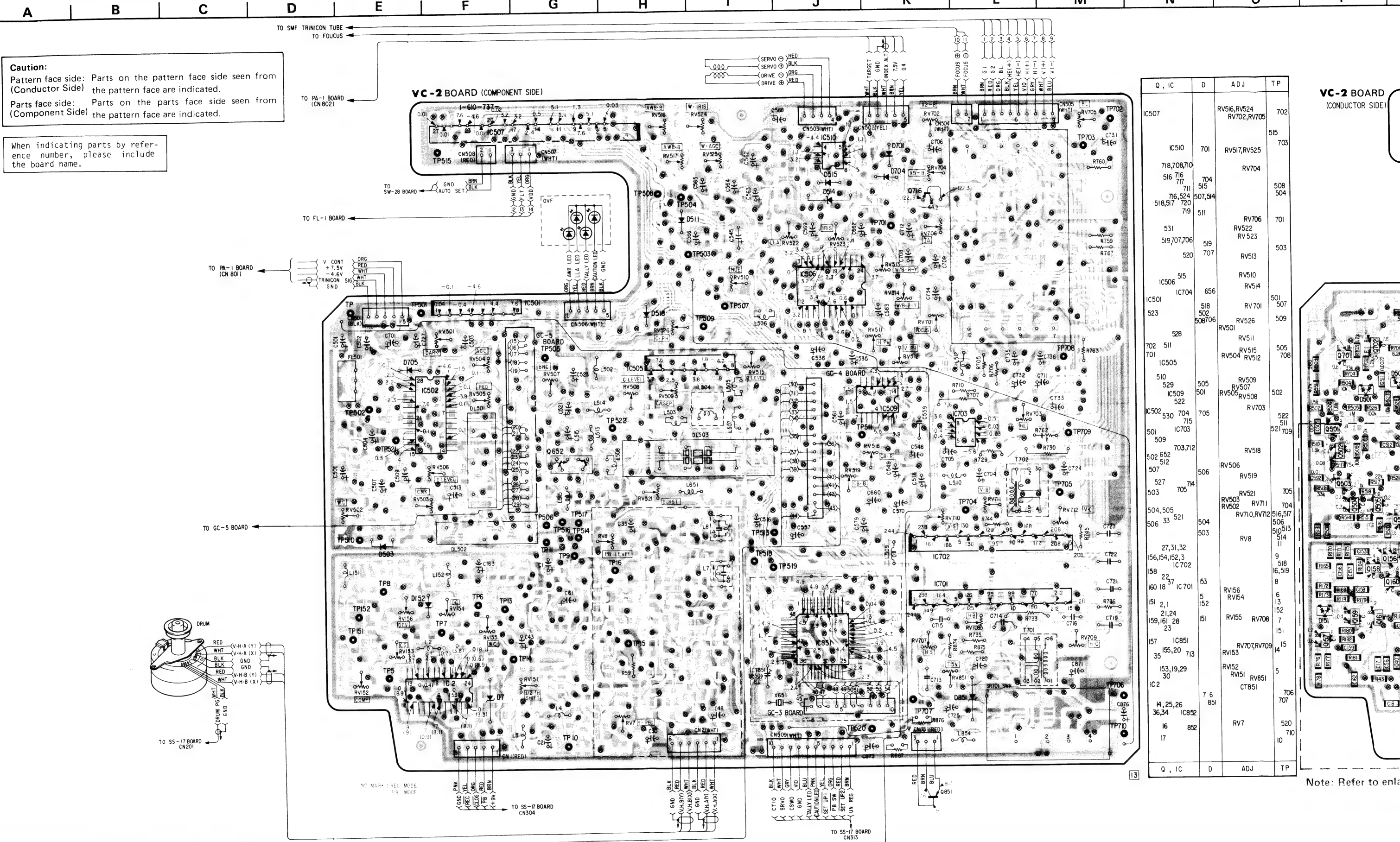


VC-2 (Y & CHROMA SIGNALS PROCESS) PRINTED WIRING BOARD

— Ref. No. VC-2 BOARD : 1,000 series —

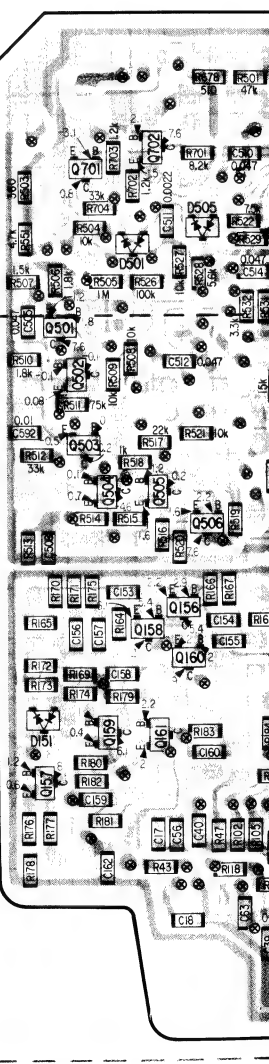
Caution:
 Pattern face side: Parts on the pattern face side seen from (Conductor Side) the pattern face are indicated.
 Parts face side: Parts on the parts face side seen from (Component Side) the pattern face are indicated.

When indicating parts by reference number, please include the board name.

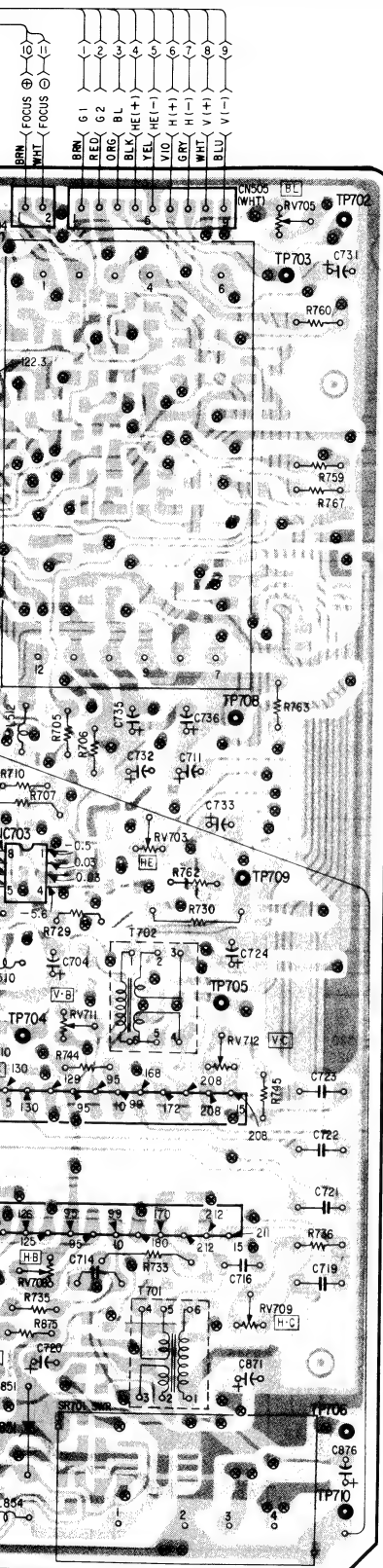


Q, IC	D	ADJ	TP
IC507		RV516, RV524 RV702, RV705	702
			515
IC510	701	RV517, RV525	703
718, 708, 710		RV704	
516, 716, 717	704		508
711	515		504
716, 524, 720	507, 514		
518, 517, 719	511		
		RV706	701
531		RV522 RV523	
519, 707, 706	519		503
520	707	RV513	
		RV510	
IC506	515	RV514	
IC501	IC704		501
523	518	RV701	507
	502		
	508, 706	RV526	509
		RV501	
528		RV511	
702, 511, 701		RV515 RV504, RV512	505 708
IC505			
510	505	RV509	
529	501	RV507 RV508	502
IC509	522		
IC502	704	RV703	
530	715		522
501	IC703		511
509			521, 709
502, 652, 512	703, 712		
507	512	RV518	
527	506	RV506	
503	705	RV519	
		RV521	705
504, 505		RV503 RV502	704
506	33, 521	RV710, RV712	516, 517
			506
	503	RV8	510, 513
			514
			11
27, 31, 32			9
156, 154, 152, 3			518
IC702			16, 519
158	22		8
160, 18	153	RV156 RV154	6
151	5		13
21, 24	152		152
159, 161, 28	151	RV155 RV708	7
23			151
157	IC851		
35	155, 20, 713	RV707, RV709	15
		RV153	14
153, 19, 29		RV152	5
30		RV851	
IC2		CT851	
	7, 6		706
	851		707
14, 25, 26			
36, 34	IC852		
16	852	RV7	520
17			710
			10

VC-2 BOARD
(CONDUCTOR SIDE)

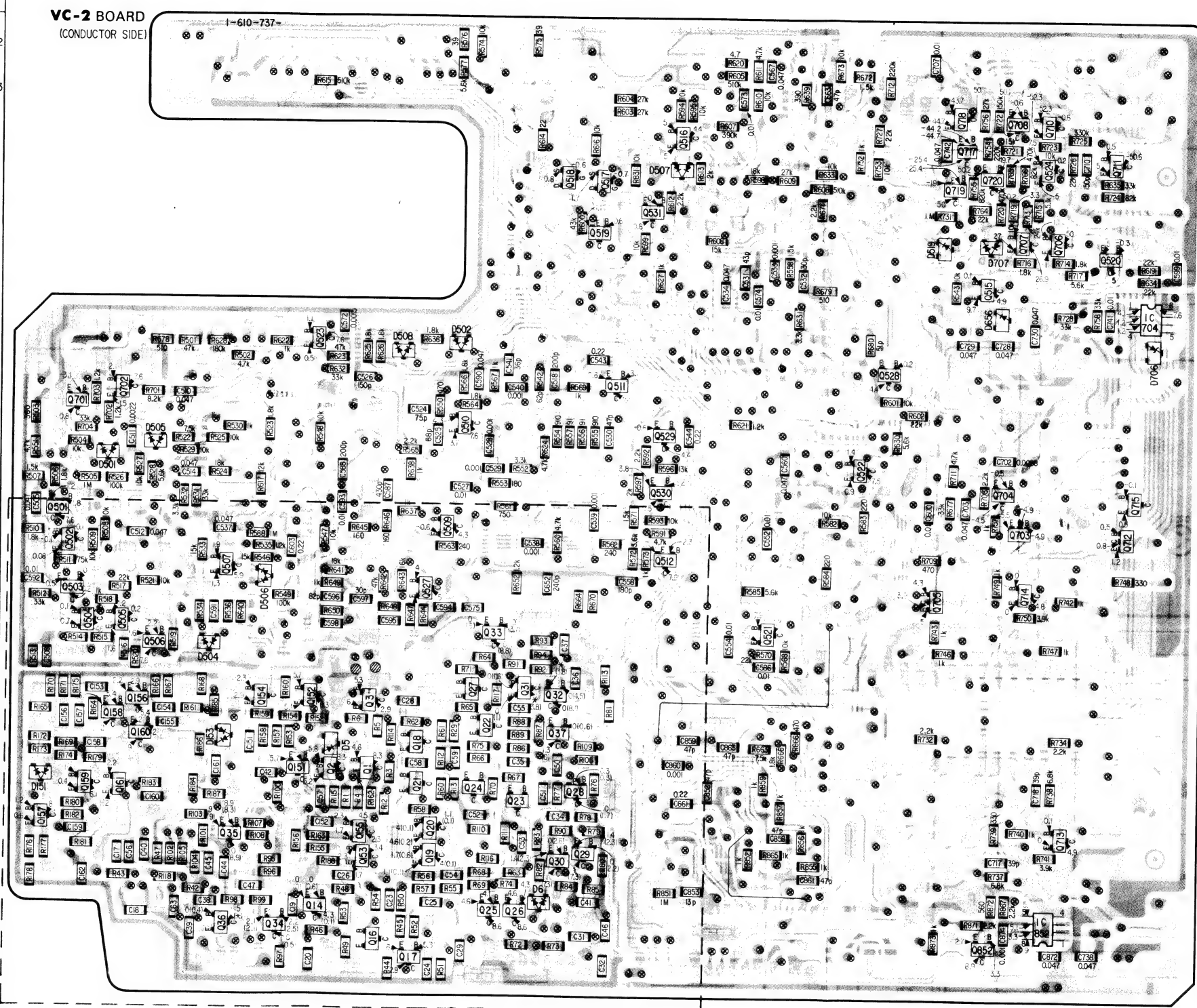


Note: Refer to enlarged V



Q, IC	D	ADJ	TP
IC507		RV516, RV524 RV702, RV705	702
IC510	701	RV517, RV525	703
718, 708, 710 516 716 717	704	RV704	508
711	515		504
716, 524 518, 517	507, 54		
719	511		
531		RV706	701
519, 707, 706	519	RV522 RV 523	503
520	707	RV513	
IC506	515	RV510	
IC704	656	RV514	501
IC501	518	RV 701	507
523	502	RV526	509
508, 706		RV501	
528		RV511	
702 511		RV515	505
701		RV504 RV512	708
IC505			
510	505	RV509	
529	501	RV507	
IC509		RV508	502
522		RV703	
IC502	530 704		522
501	715		511
IC703			521 709
509	703, 712	RV518	
502 652			
512		RV506	
507	506	RV519	
527	705 74	RV521	705
503		RV503 RV711	
504, 505		RV710, RV712	704
506 33 521	504		516, 517
503		RV8	510 513
			514
27, 31, 32			11
156, 154, 152, 3			9
IC 702			518
158			16, 519
22 37	153		8
160 18	5	RV156	
IC 701	152	RV154	6
151			13
2, 1			152
21, 24		RV155	7
159, 161 28	151	RV708	
23			151
IC851		RV707, RV709	15
155, 20		RV153	14
713		RV152	
153, 19, 29		RV151	5
30		RV851	
IC2	7 6	CT851	706
	851		707
14, 25, 26			
36, 34		RV7	520
IC852			710
16	852		
17			10

VC-2 BOARD
(CONDUCTOR SIDE)



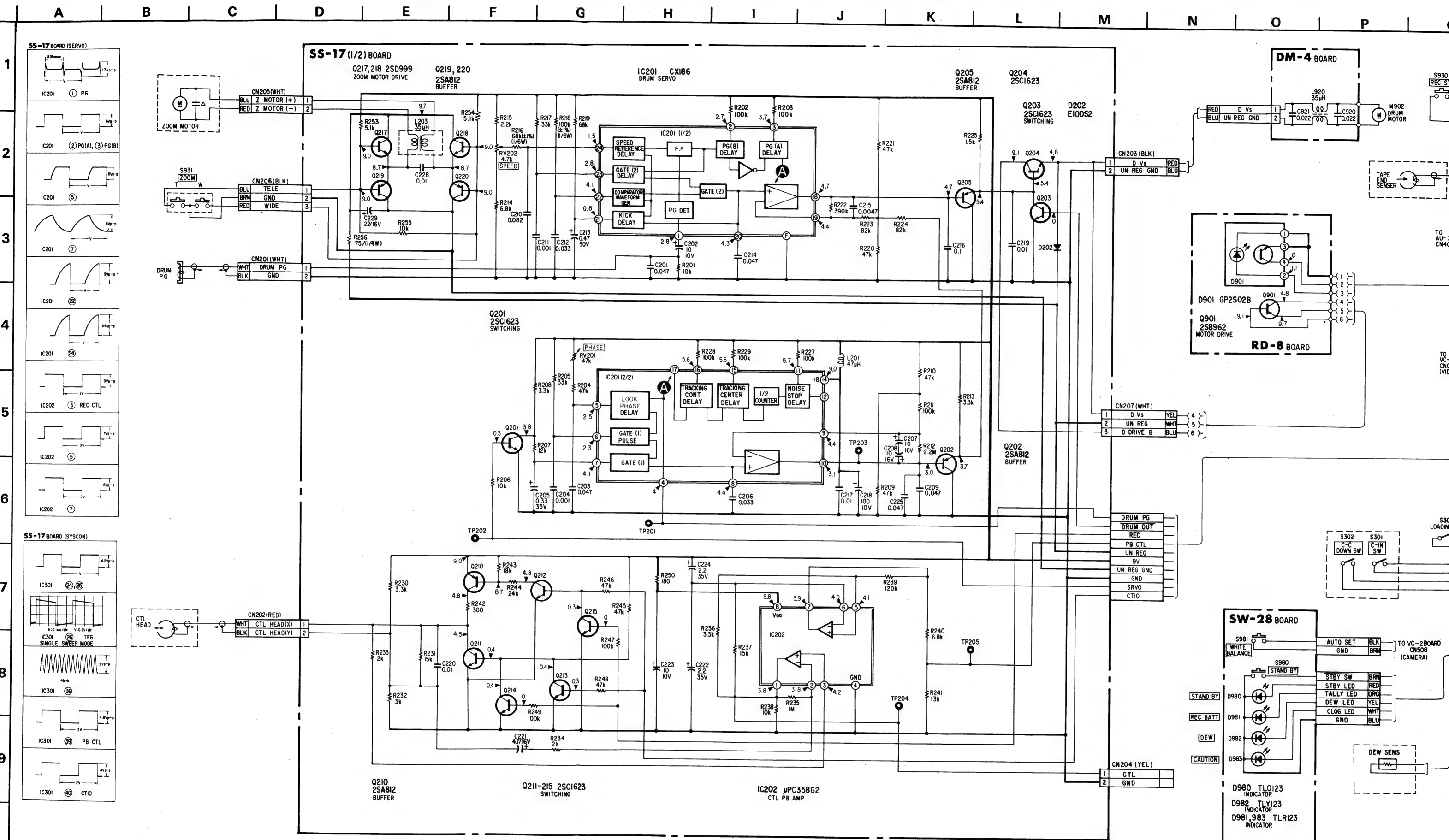
Note: Refer to enlarged VC-2 Board on page 89, 90.

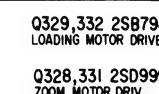
1
2
3
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13

SS-17 (SERVO/SYSTEM CONTROL), DM-4 (DRUM MOTOR), RD-8 (DRUM MOTOR DRIVE/T. FG DET), SW-28 (FUNCTION, SWITCH & IND), JK-2 (JACK), LM-12 (LOADING MOTOR) SCHEMATIC DIAGRAM
 - Ref. No. SS-17/BOARD : 3,000 series, DM-4, RD-8, SW-28, JK-2, LM-12 BOARD : 3,900 series -

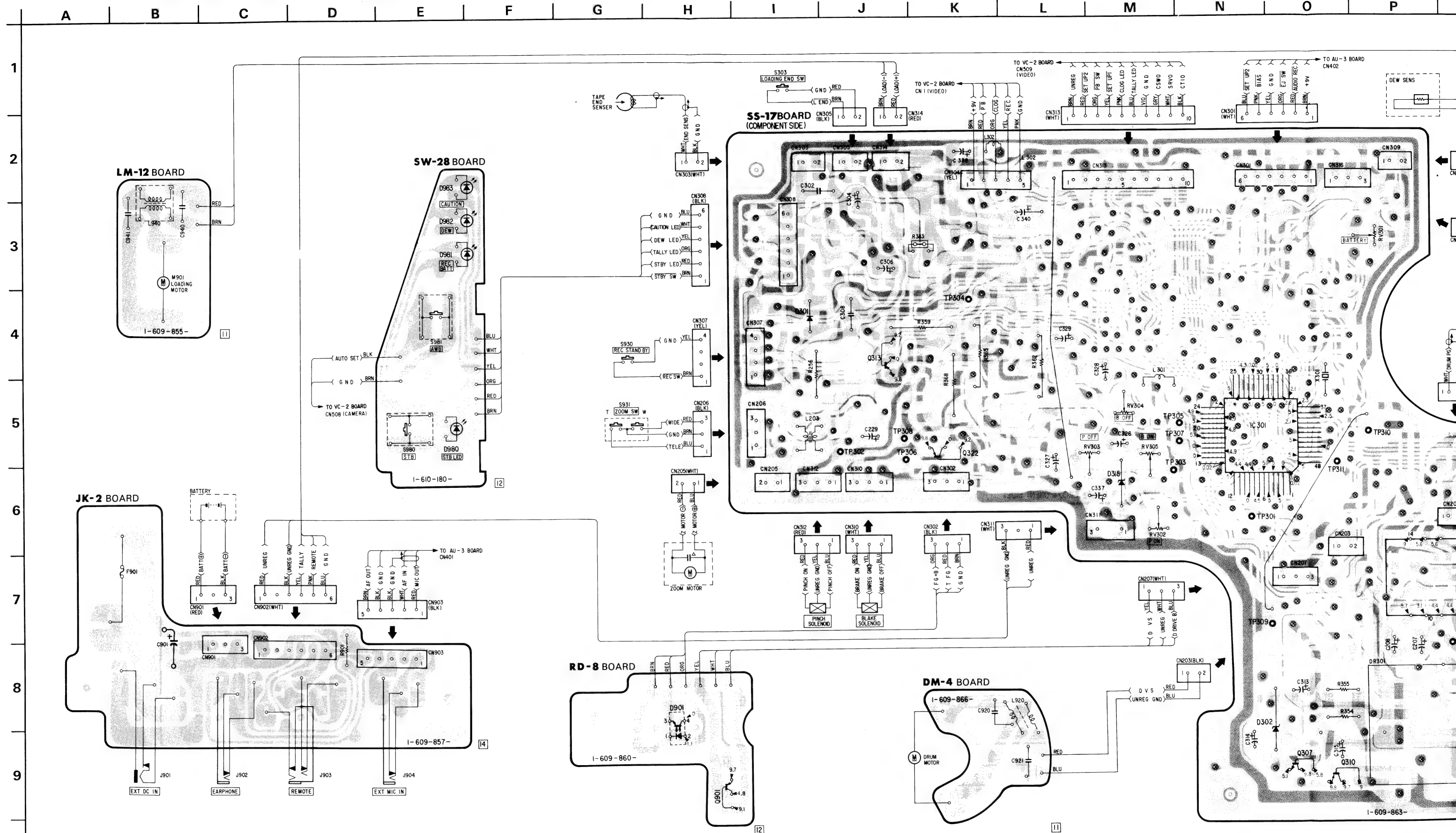


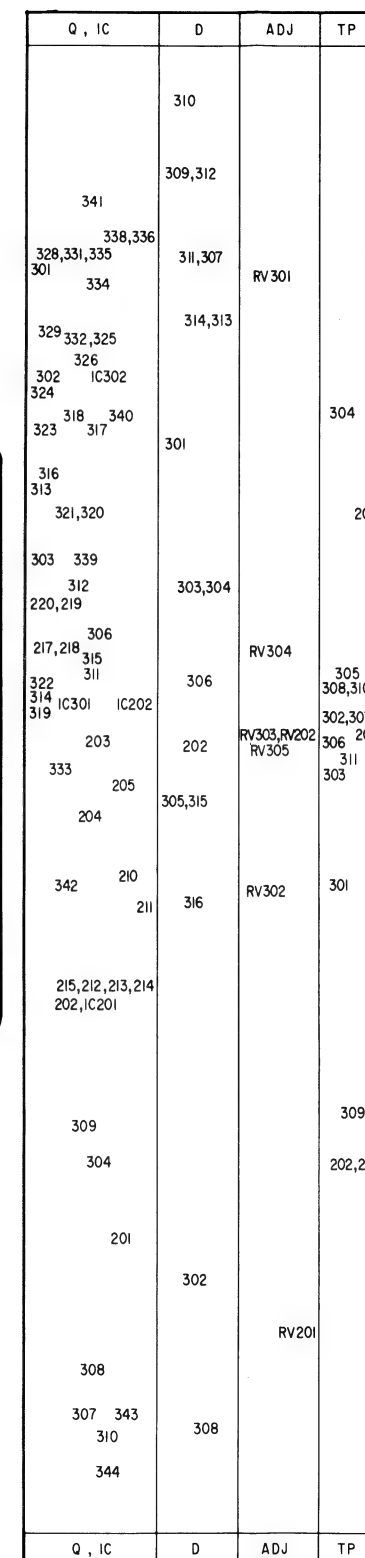




SERVO, SYSTEM CONTROL

SS-17 (SERVO/SYSTEM CONTROL), DM-4 (DRUM MOTOR), RD-8 (DRUM MOTOR DRIVE/T. FG DET), SW-28 (FUNCTION, SWITCH & IND), JK-2 (JACK), LM-12 (LOADING MOTOR) PRINTED WIRING BOARDS
 - Ref. No. SS-17 BOARD : 3,000 series, DM-4, RD-8, SW-28, JK-2, LM-12 BOARD : 3,900 series -

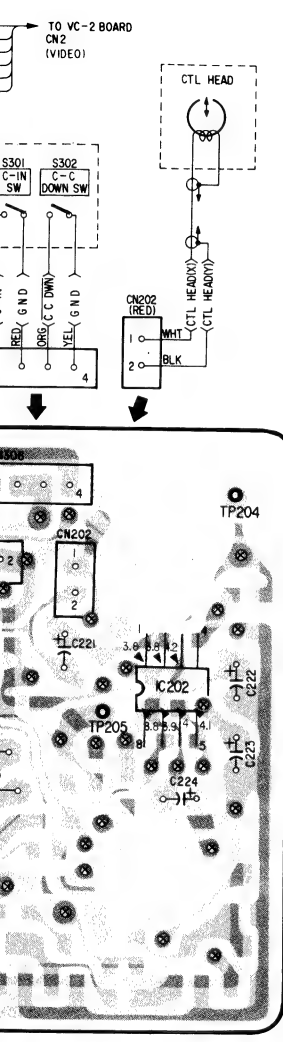




S T U V W X Y Z A1 B1 C1 D1 E1 F1 G1 H1 I

Caution:
Pattern face side: Parts on the pattern face side seen from (Conductor Side) the pattern face are indicated.
Parts face side: Parts on the parts face side seen from (Component Side) the pattern face are indicated.

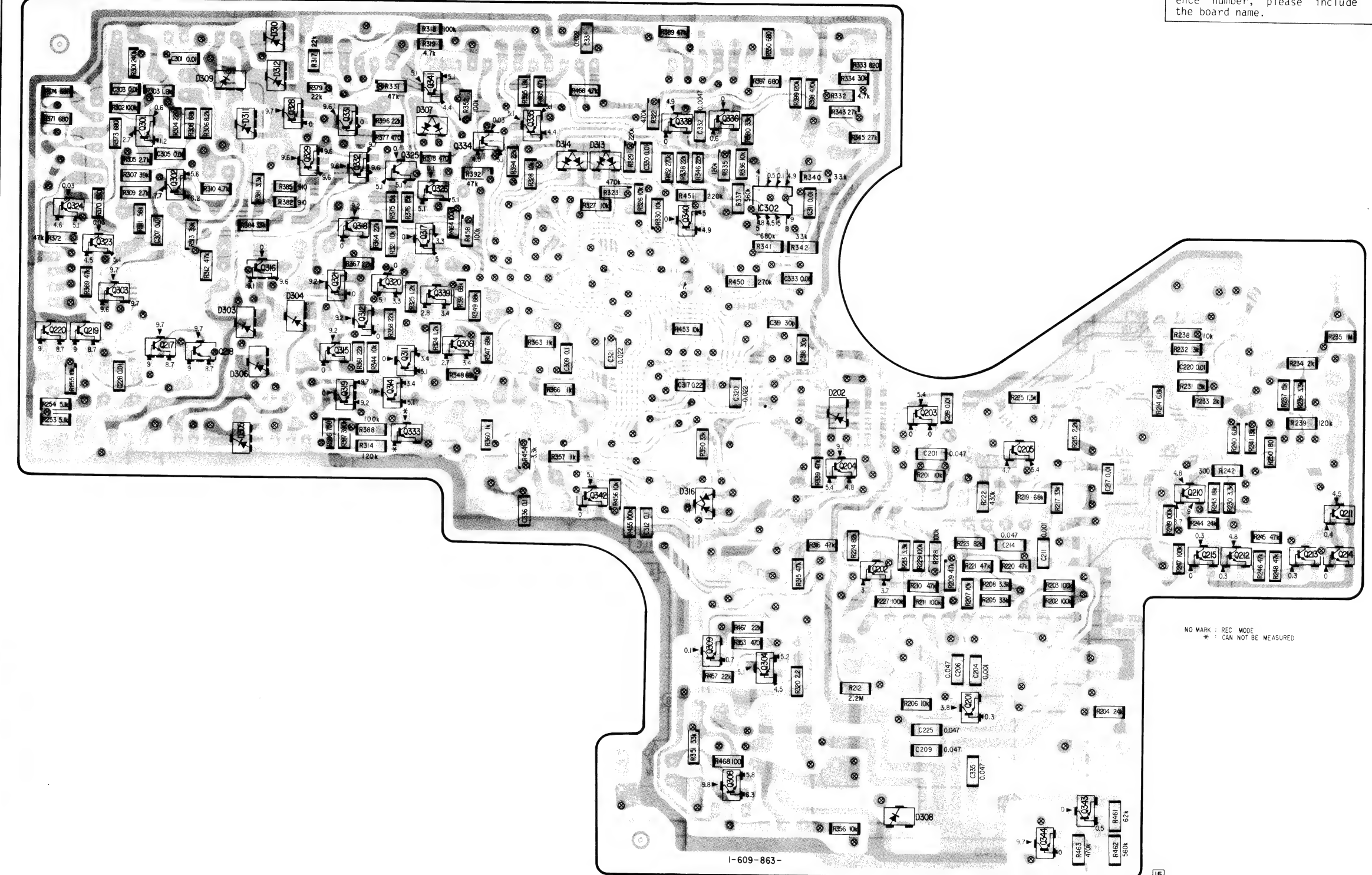
When indicating parts by reference number, please include the board name.



MARK : REC. MODE
* : CAN NOT BE MEASURED

Q, IC	D	ADJ	TP
310	310		
309,312	309,312		
341	311,307	RV301	
338,336	314,313		
328,331,335	301		
334			
329	304		
332,325			
326			
302 IC302			
324			
318 340			
323 317			
316			
313			
321,320			
303 339			
312			
220,219			
306			
217,218			
315			
322 IC301			
319 IC202			
203			
333			
205			
204			
305,315			
342			
210			
211			
316			
215,212,213,214			
202,IC201			
309			
304			
201			
302			
308			
307 343			
310			
344			
Q, IC	D	ADJ	TP

SS-17 BOARD(CONDUCTOR SIDE)



NO MARK : REC. MODE
* : CAN NOT BE MEASURED

AU-3 (AUDIO SIGNAL RECORD/MONITOR PROCESS), AU-4 (AUDIO SIGNAL RECORD PROCESS), TRANSLATION (MIC IN) SCHEMATIC DIAGRAM

— Ref. No. AU-3, AU-4 BOARD : 4,400 series, TRANSLATION BOARD : 5,000 series —

AUDIO AUDIO

A B C D E F G H I J K L M N O P

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2

3

4

5

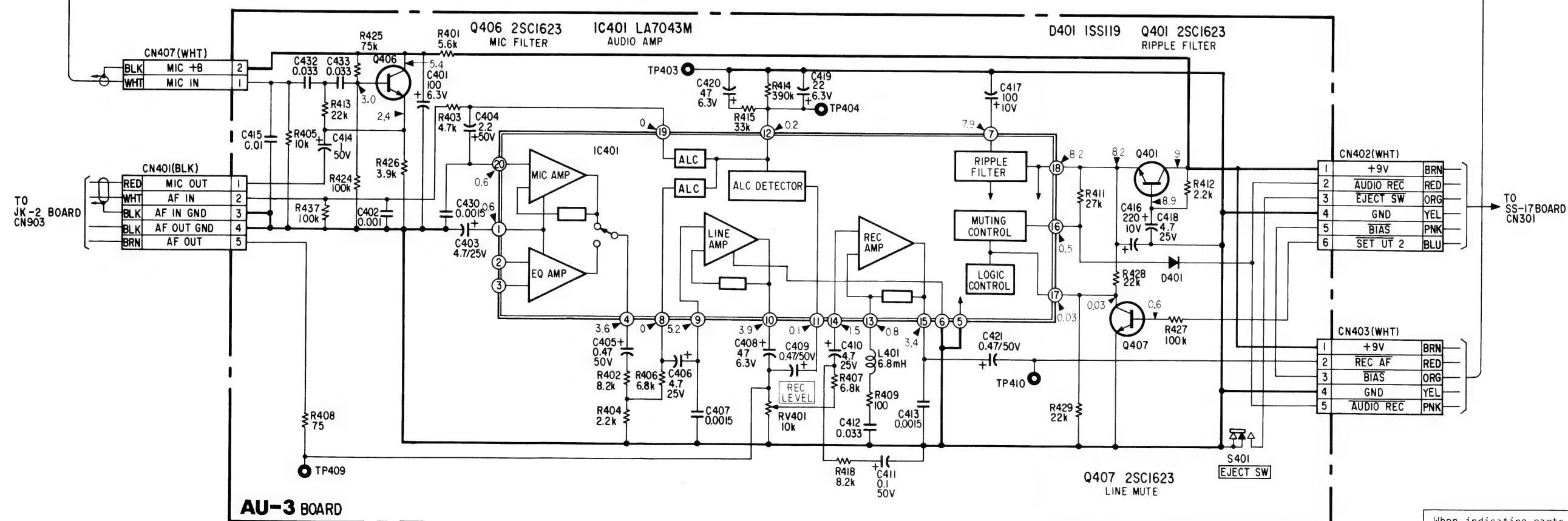
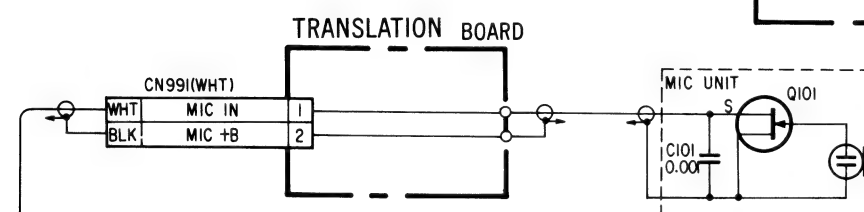
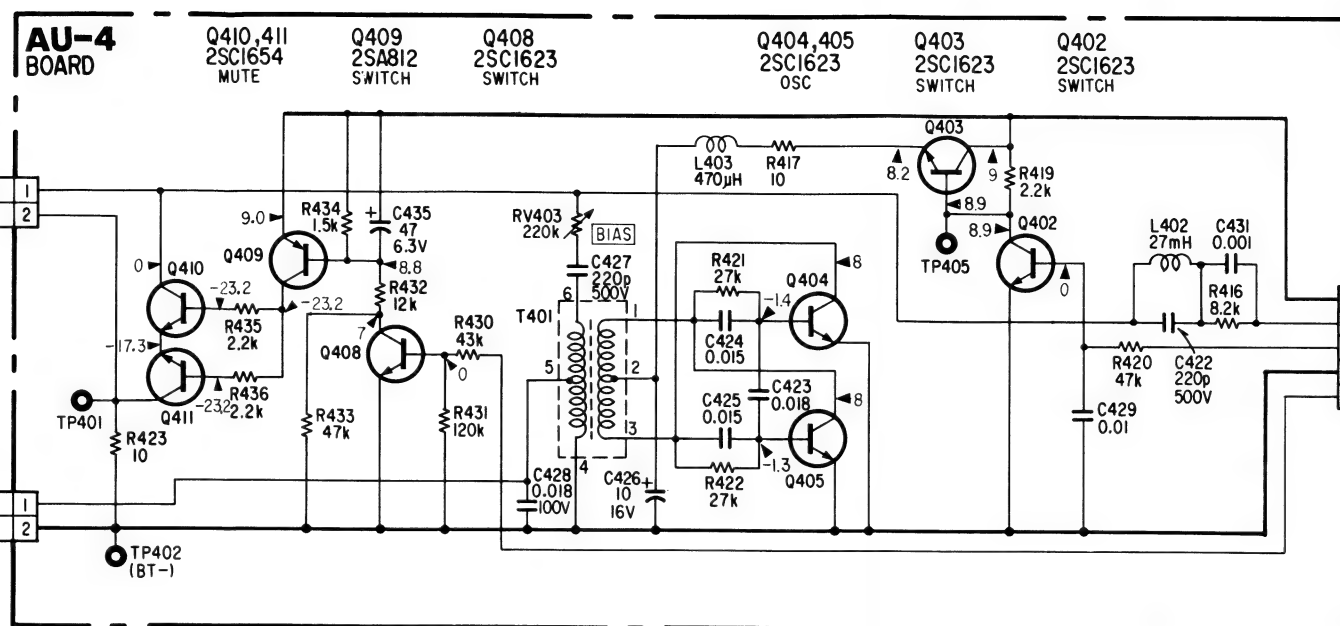
6

7

8

9

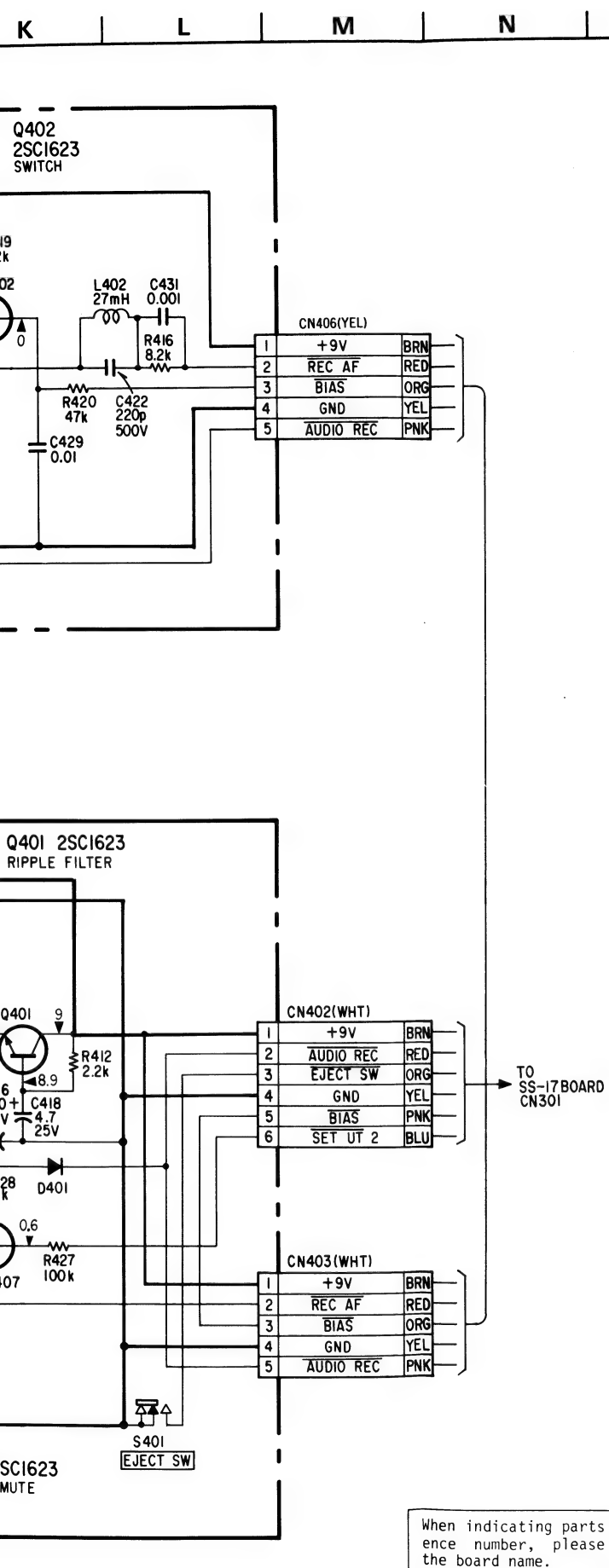
10



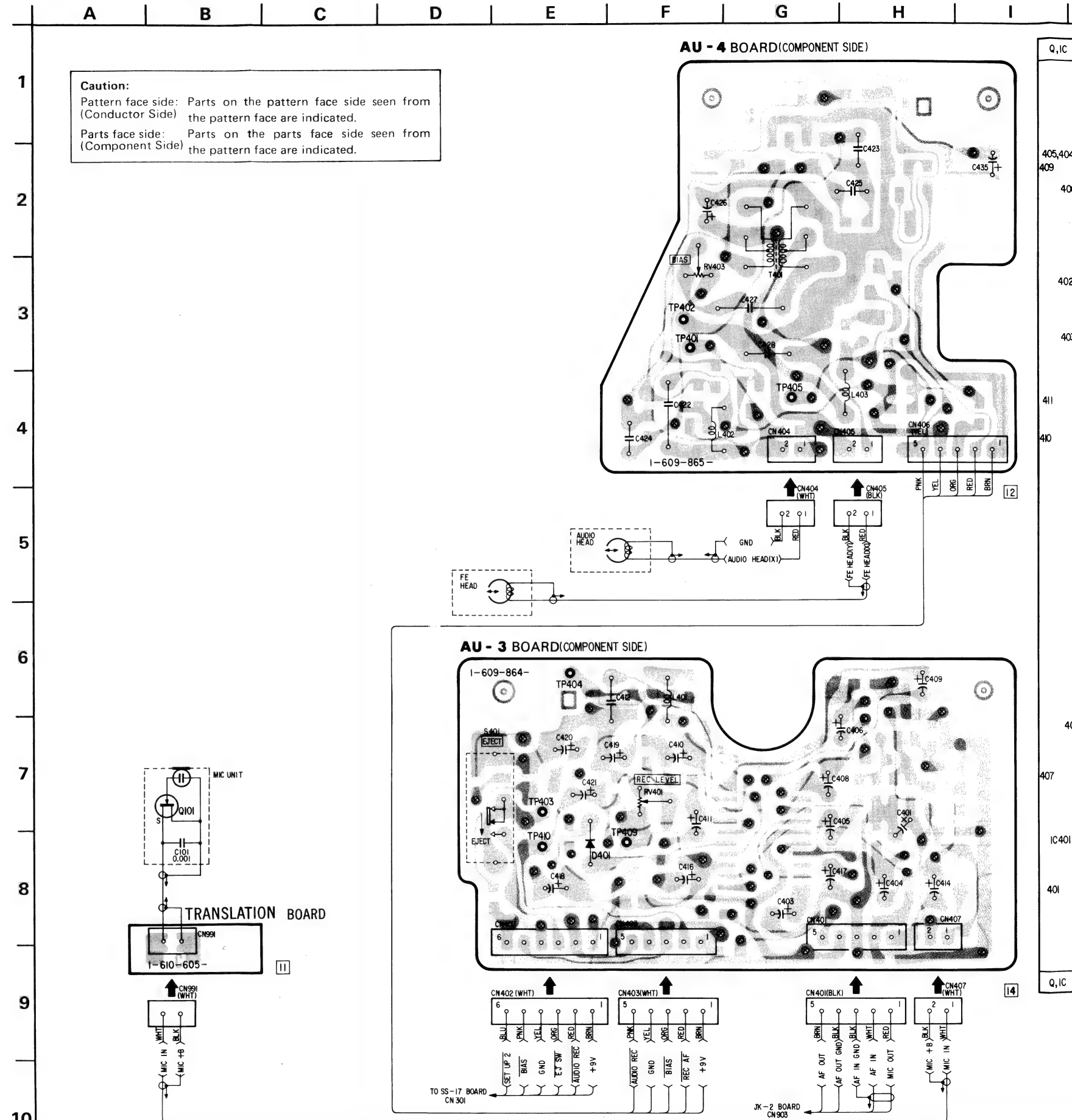
When indicating parts by reference number, please include the board name.

AU-3 (AUDIO SIGNAL RECORD/MONITOR PROCESS), AU-4 (AUDIO SIGNAL RECORD PROCESS), TRANSLATION (MIC IN) PRINTED WIRING

— Ref. No. AU-3, AU-4 BOARD : 4,400 series, TRANSLATION BOARD : 5,000 series —



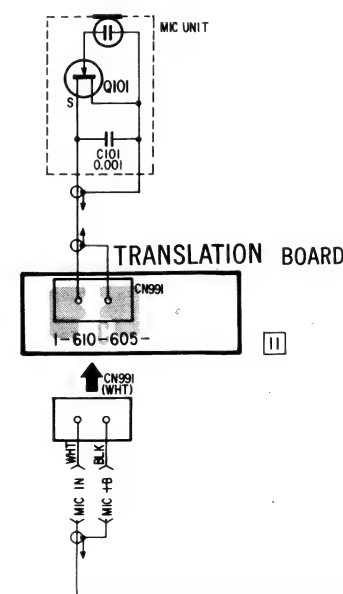
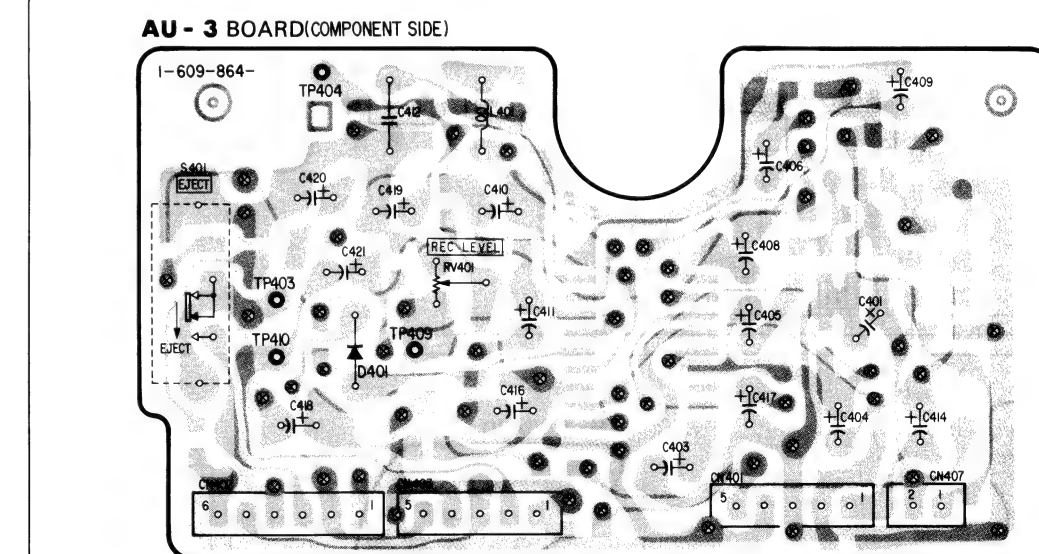
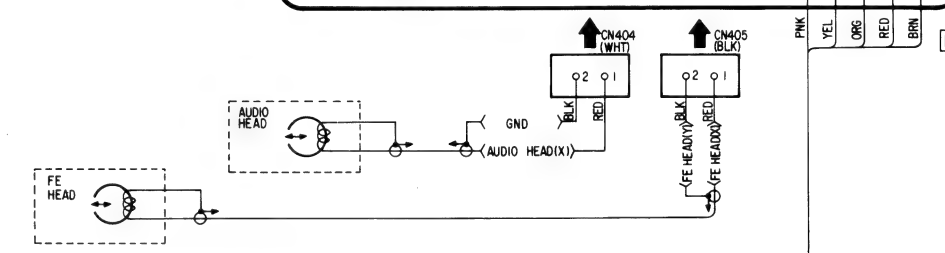
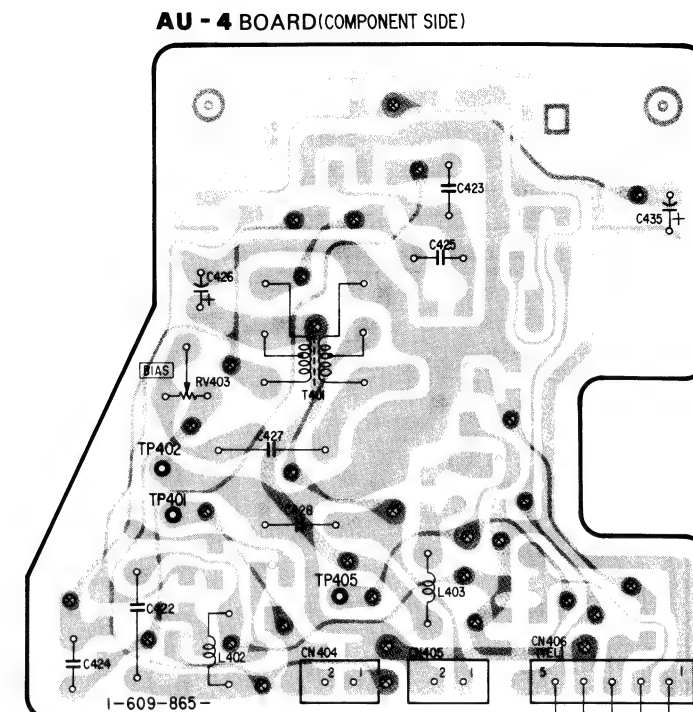
When indicating parts by reference number, please include the board name.



Caution:

Pattern face side: Parts on the pattern face side seen from
(Conductor Side) the pattern face are indicated.

Parts face side: Parts on the parts face side seen from
(Component Side) the pattern face are indicated.



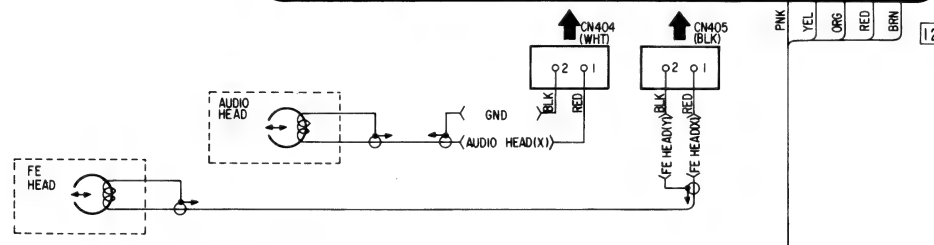
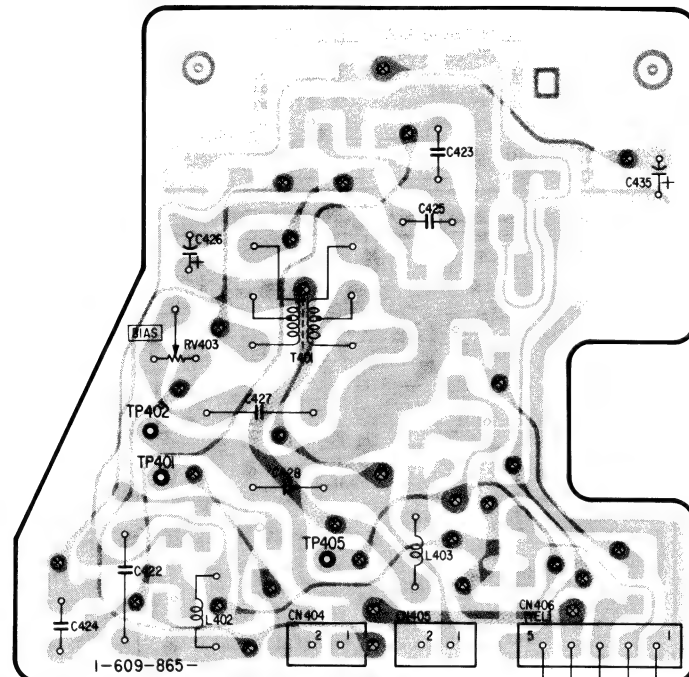
A B C D E F G H I J K L M N O P

Caution:

Pattern face side: Parts on the pattern face side seen from (Conductor Side) the pattern face are indicated.

Parts face side: Parts on the parts face side seen from (Component Side) the pattern face are indicated.

AU - 4 BOARD (COMPONENT SIDE)

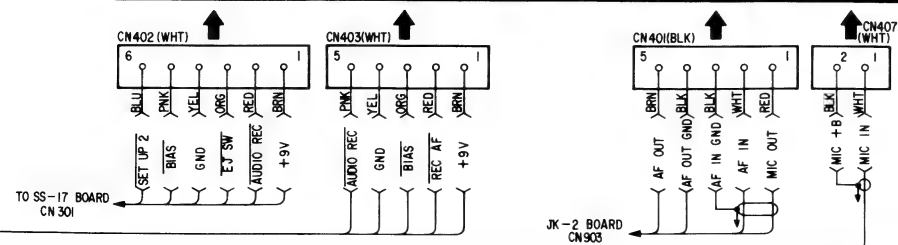
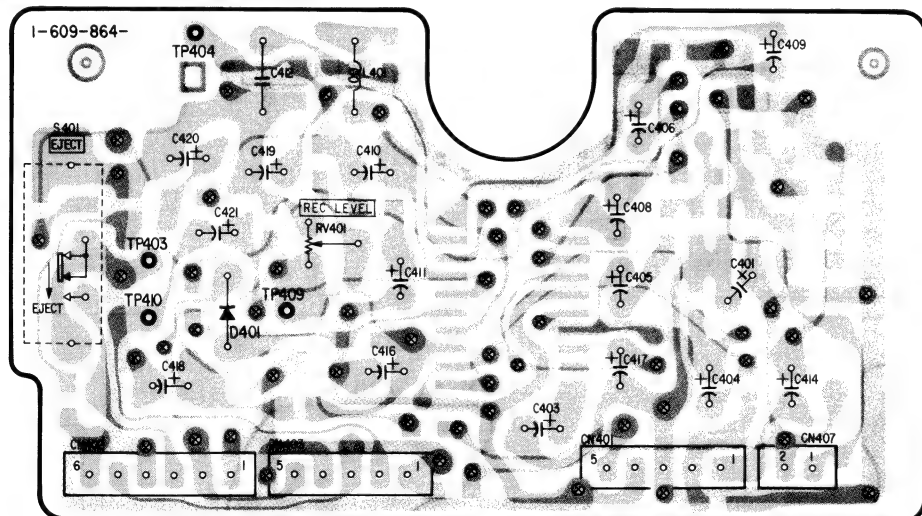


AU - 4 BOARD (CONDUCTOR SIDE)

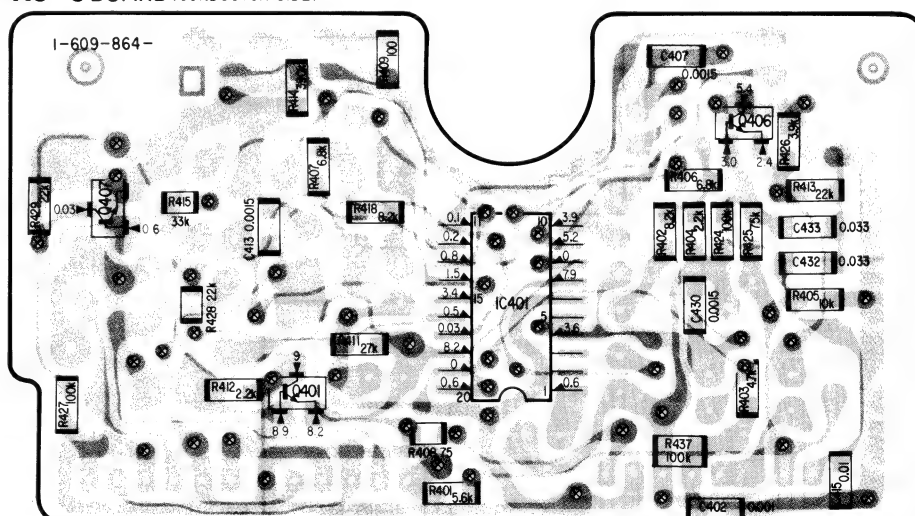


NO MARK - REC MODE

AU - 3 BOARD (COMPONENT SIDE)



AU - 3 BOARD (CONDUCTOR SIDE)



NO MARK - REC MODE

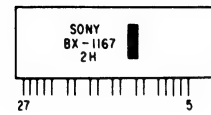
When indicating parts by reference number, please include the board name.

Caution:
Pattern face side: Parts on the pattern face side seen from
(Conductor Side) the pattern face are indicated.

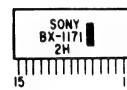
NO MARK : REC MODE
() : PB MODE
* : CAN NOT BE MEASURED

4-4. SEMICONDUCTORS

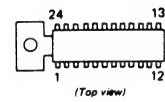
BX-1167A



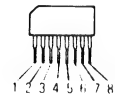
BX-1171



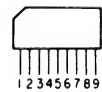
CX186



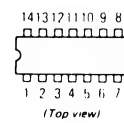
CX816



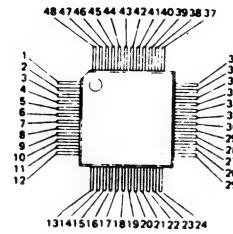
CX10018



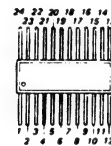
CX896



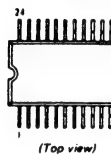
CX7986
MB88501-167N



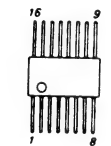
CX10041



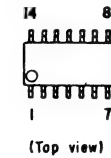
CX20004



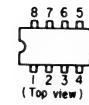
CX22017



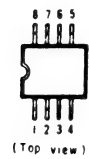
CX20059
CX20065



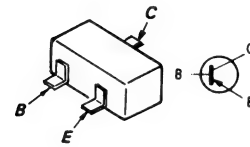
μPC4558G2



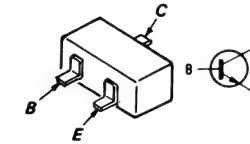
μPC358G
μPC358G2
μPC393G2



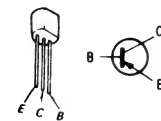
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2SA1122
2SA1226-E4



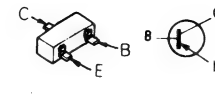
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2SC2223-F14
2SC2712



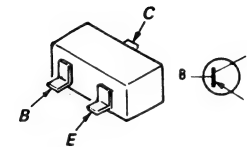
2SA1091



2SA1162
2SA1179



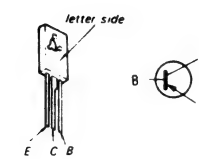
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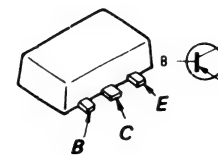
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2SC1654



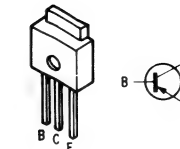
2SB772



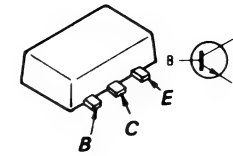
2SB798



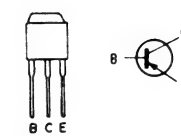
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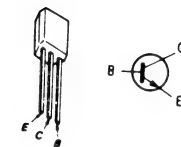
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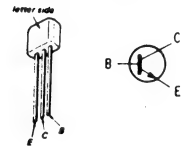
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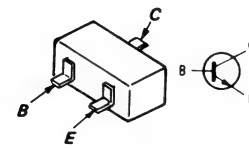
2SC2458
2SC2603



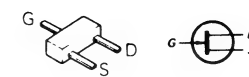
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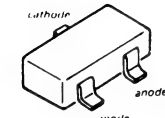
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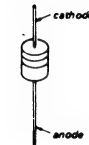
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2SK209Y



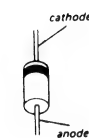
1S2835
1S2837
1SS123
MA151WA
RD5.6M-B1
RD7.5M-T2B1



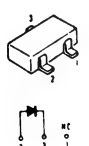
1SS119
1SS148



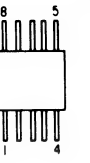
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HZ6C2L
HZ6C3L
RD12E-B2
RD12E-B3



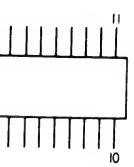
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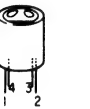
NJM4556M-A



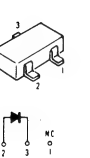
LA7043M



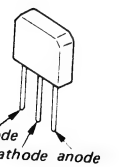
GP-2S02B



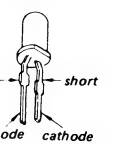
RD6.8M-B3



1T25



TLO123
TLR123
TLY123



SECTION 5 EXPLODED VIEWS

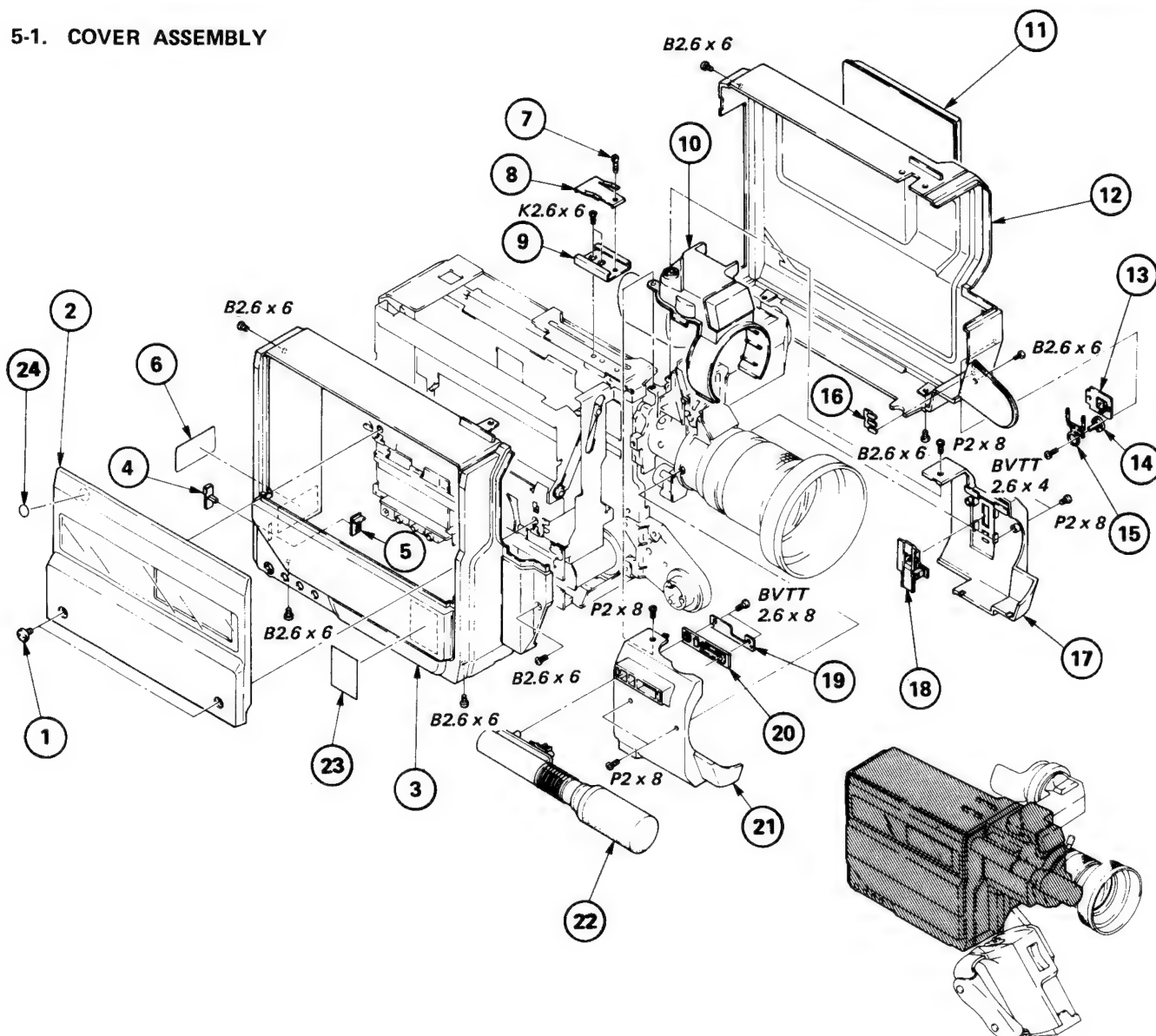
NOTE:

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.

- Items marked "▲" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

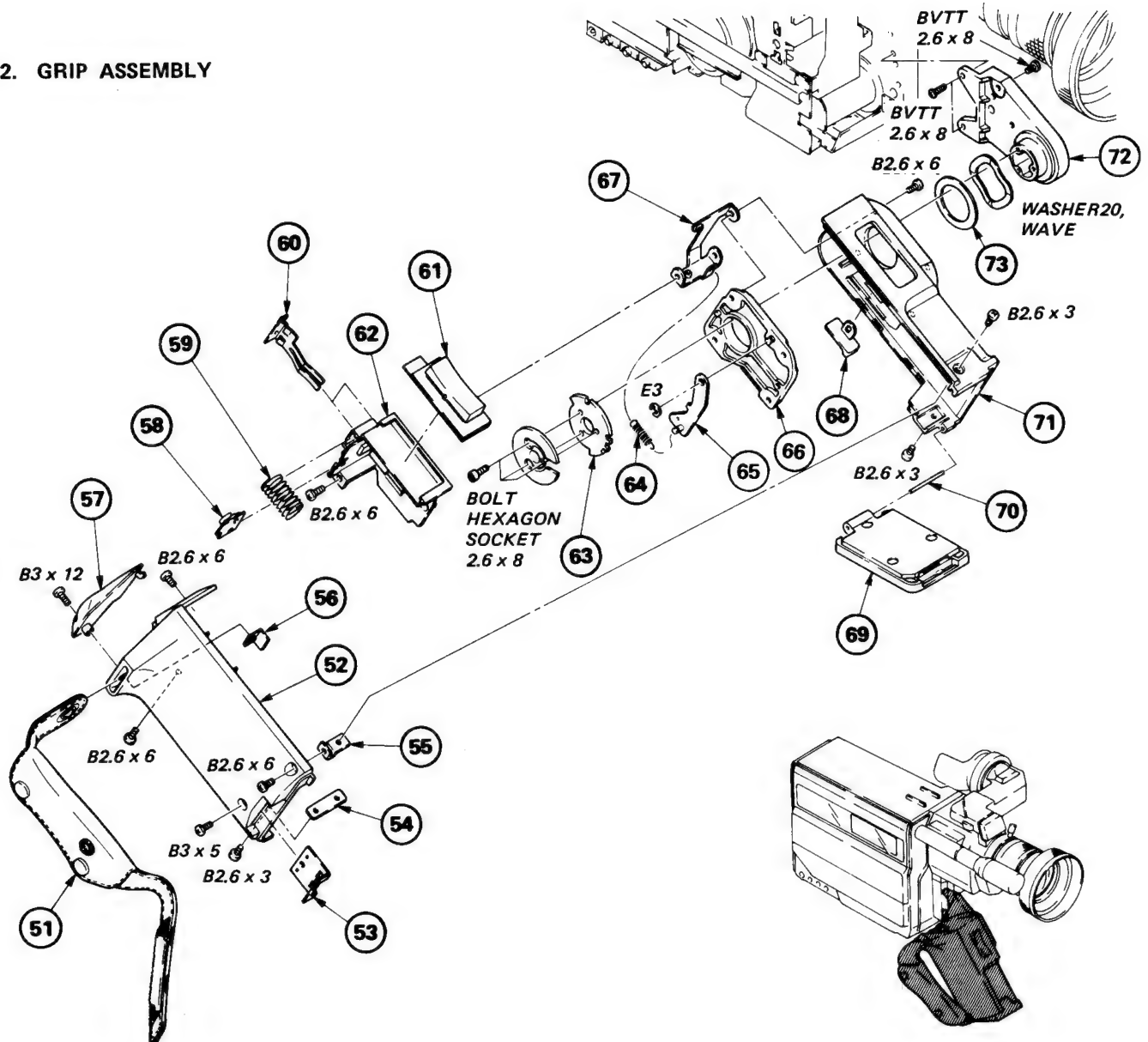
The components identified by shading and mark ▲ are critical for safety. Replace only with part number specified.

5-1. COVER ASSEMBLY



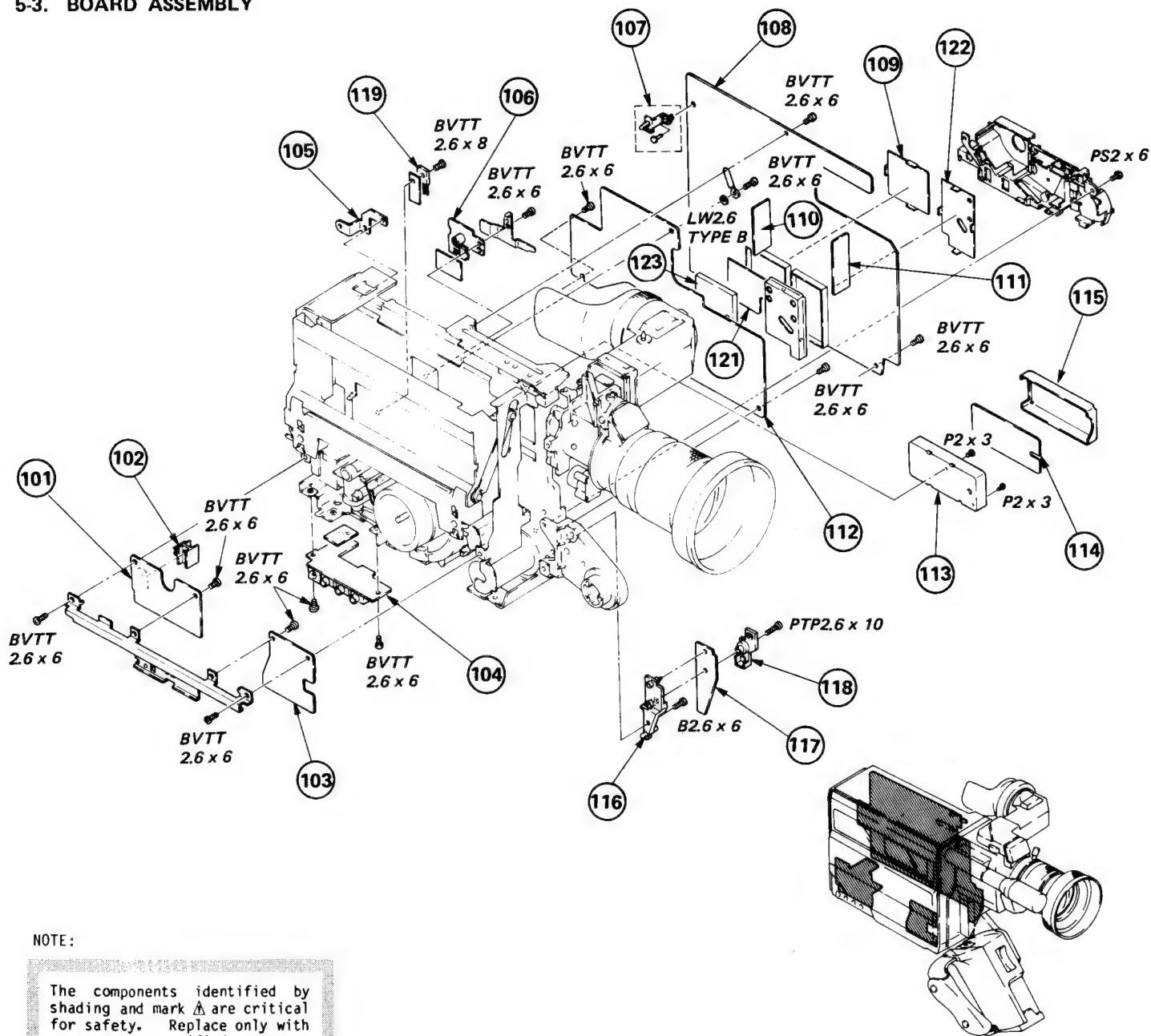
No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
1	3-669-403-00	SCREW, ORNAMENTAL		12	3-681-633-00	CABINET (RIGHT)	
2	X-3681-463-0	LID ASSY, CASSETTE COMPARTMENT		13	X-3681-437-0	BUTTON ASSY, STAND BY	
3	3-681-634-00	CABINET (LEFT)		14	3-681-552-00	BUTTON, W.B	
4	3-681-550-00	BUTTON, EJECT		15	3-681-554-00	SPRING	
5	3-681-551-00	RETAINER, BUTTON, EJECT		16	3-681-553-00	INDICATOR, LED	
6	▲3-681-677-00	LABEL, MODEL NUMBER AEP ONLY		17	3-681-635-00	CABINET (RIGHT), LENS	
		LABEL, MODEL NUMBER E,UK ONLY		18	X-3681-801-0	KNOB ASSY, F.SWITCH	
7	3-681-544-00	SCREW, STOPPER, ACC SHOE		19	▲3-681-662-00	PLATE, PUSH	
8	3-681-543-00	SPRING, LEAF		20	3-681-661-00	PACKING (B), RUBBER	
9	3-681-542-00	SHOE, ACC		21	3-681-636-00	CABINET (LEFT), LENS	
10	X-3681-442-0	CABINET (T) ASSY, LENS		22	8-814-165-01	MICROPHONE, BUILT-IN (C-2003)	
11	3-681-653-00	PAD, CABINET		23	3-703-707-01	STICKER, SONY SYMBOL (21)	
				24	3-566-226-21	LABEL, PUSH	

5-2. GRIP ASSEMBLY



No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
51	3-681-657-00	BAND, GRIP		63	▲:3-681-607-00	PLATE, FIXED, GLIP	
52	3-681-603-00	CABINET (LEFT), GRIP		64	3-489-093-00	SPRING, TENSION	
53	3-681-566-00	BRACKET (B), BAND		65	▲:X-3681-424-0	PLATE ASSY, LOCK, GLIP	
54	▲:3-681-559-00	STOPPER (C), GLIP		66	▲:X-3681-418-0	TABLE ASSY (2), ROTARY	
55	▲:3-681-562-00	STOPPER (B), GRIP		67	▲:3-681-561-00	STOPPER, GRIP	
56	3-681-565-00	BRACKET (A), BAND		68	3-681-560-00	BUTTON, LOCK RELEASE	
57	3-681-595-00	COVER, GRIP		69	A-6703-335-A	LID ASSY, BATTERY CASE	
58	1-554-561-00	SWITCH, TACT (REC)	S930	70	▲:3-681-557-00	SHAFT, FULCRUM, BATTERY CASE LID	
59	3-681-569-00	SPRING, COMPRESSION		71	3-681-602-00	CABINET (RIGHT), GRIP	
60	3-681-568-00	TERMINAL, BATTERY		72	▲:3-681-594-00	RETAINER, GRIP	
61	1-554-560-00	SWITCH, SEESAW (ZOOM)	S931	73	▲:3-651-378-00	SHEET, FRICTION ADJUSTMENT	
62	3-681-593-00	CHASSIS, GRIP					

5-3. BOARD ASSEMBLY



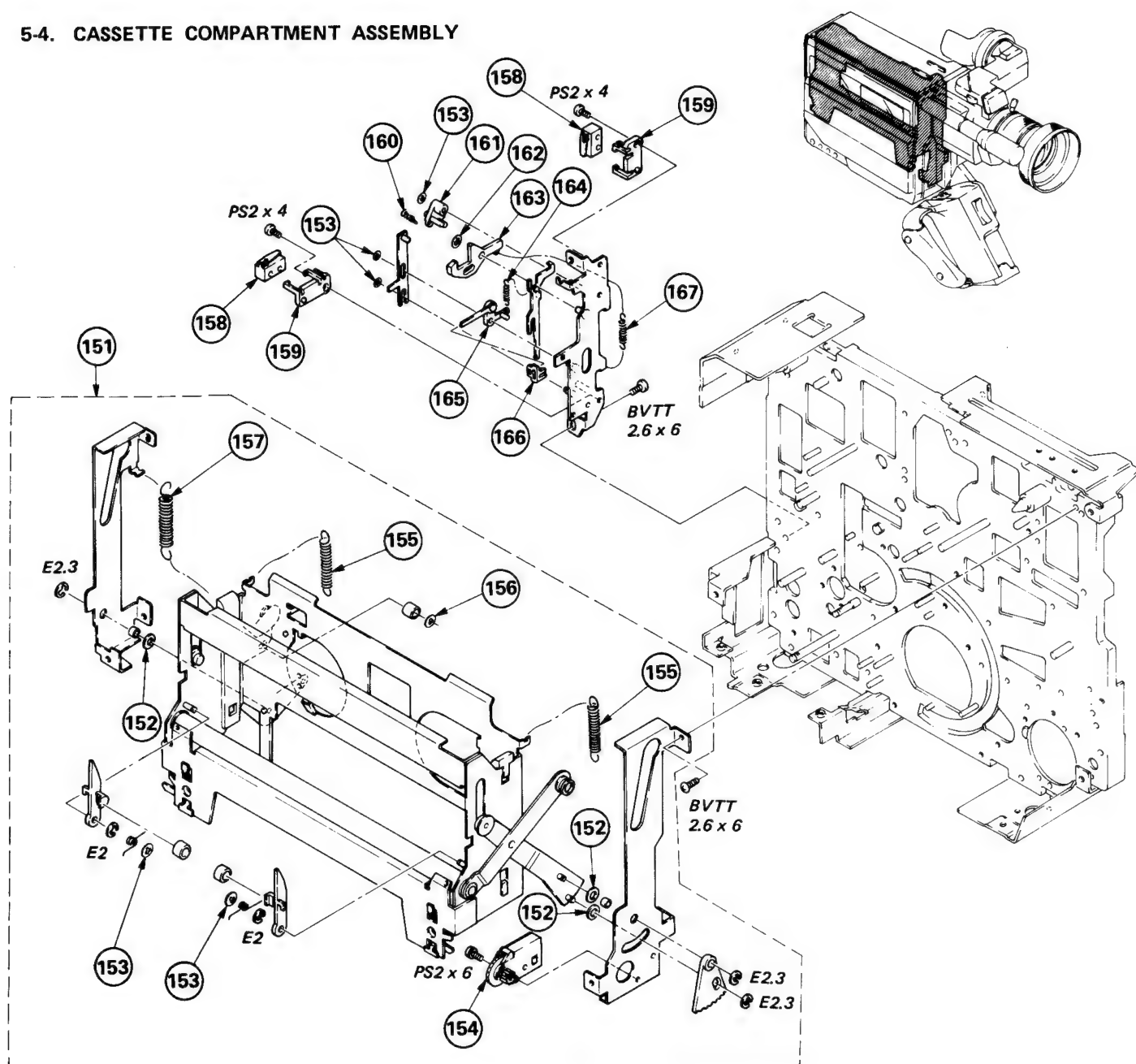
NOTE:

The components identified by shading and mark **A** are critical for safety. Replace only with part number specified.

No.	Part No.	Description
101	▲:1-609-864-00	AU-3 BOARD
102	3-681-549-00	JOINTER, EJECT BUTTON
103	▲:1-609-865-00	AU-4 BOARD
104	▲:1-609-857-00	JK-2 BOARD
105	3-681-548-00	BRACKET, HOOK
106	▲:1-609-860-00	RD-8 BOARD
107	▲:3-681-663-00	HOLDER, PC BOARD
108	▲:A-7513-003-A	VC-2 BOARD, COMPLETE
109	▲:X-3681-802-0	LID ASSY, REAR, SG SHIELD CASE
110	▲:A-7513-004-A	GC-4 BOARD, COMPLETE
111	▲:A-7513-006-A	GC-5 BOARD, COMPLETE

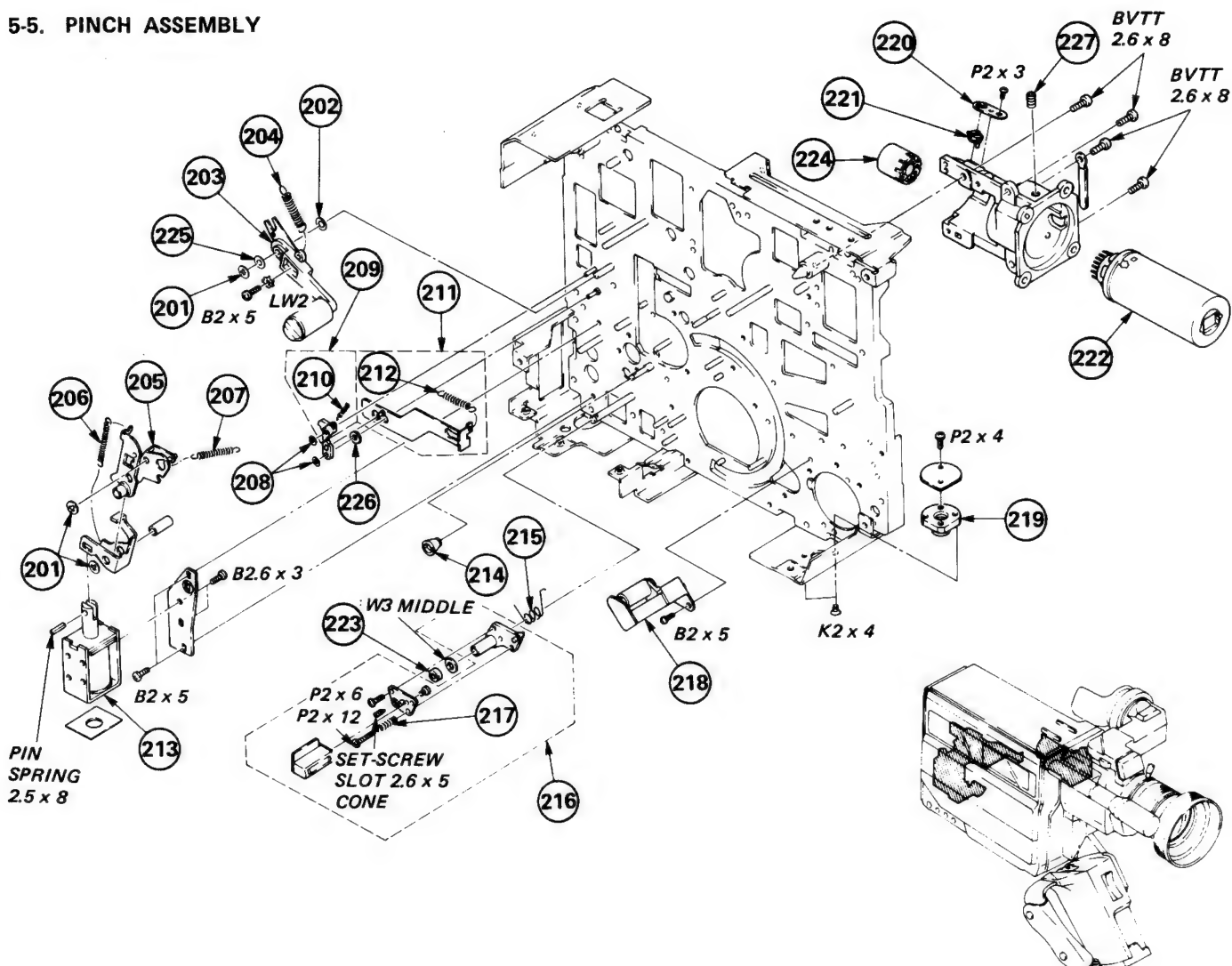
Remark	No.	Part No.	Description	Remark
	112	▲:A-6717-339-A	SS-17 BOARD, COMPLETE	
	113	▲:X-3681-804-0	CASE (MAIN) ASSY, PA SHIELD	
	114	▲:A-7511-947-A	PA-1 BOARD, COMPLETE	
	115	▲:3-681-806-00	LID, SHIELD CASE, PA	
	116	3-681-600-00	HOLDER, CONTROL PC BOARD	
	117	▲:1-610-180-00	SW-28 BOARD	
	118	3-681-652-00	GUIDE, KNOB	
	119	▲:8-729-177-22	TRANSISTOR 2SB772 (Q851)	
	121	▲:A-7513-005-A	GC-3 BOARD, COMPLETE	
	122	▲:X-3681-805-0	LID ASSY, REAR, SHIELD CASE, RA	
	123	X-3681-806-0	LID ASSY, SHIELD CASE, SG	

5-4. CASSETTE COMPARTMENT ASSEMBLY



No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
151	▲:A-6751-176-A	CASSETTE COMPARTMENT ASSY	152-157	159	▲:3-681-587-00	TABLE, SWITCH	
152	3-678-822-00	SPACER		160	3-561-627-00	SPRING, TENSION	
153	3-669-465-00	WASHER (1.5), STOPPER		161	▲:3-681-539-00	LOCK, ARM	
154	3-681-528-00	DAMPER		162	3-669-596-00	WASHER (2.3), STOPPER	
155	3-143-067-00	SPRING, TENSION		163	▲:3-681-538-00	ARM, LOCK	
156	3-669-595-00	WASHER (2), STOPPER		164	3-567-028-00	SPRING, TENSION	
157	3-681-527-00	SPRING, TENSION		165	▲:X-3681-417-0	DETECTION ASSY, LOCK	
158	1-554-582-00	SWITCH, MICRO S301 (CASSETTE IN) S302 (CASSETTE DOWN)		166	▲:3-681-588-00	STAY, DETECTION	
				167	3-555-026-00	SPRING, TENSION	

5-5. PINCH ASSEMBLY

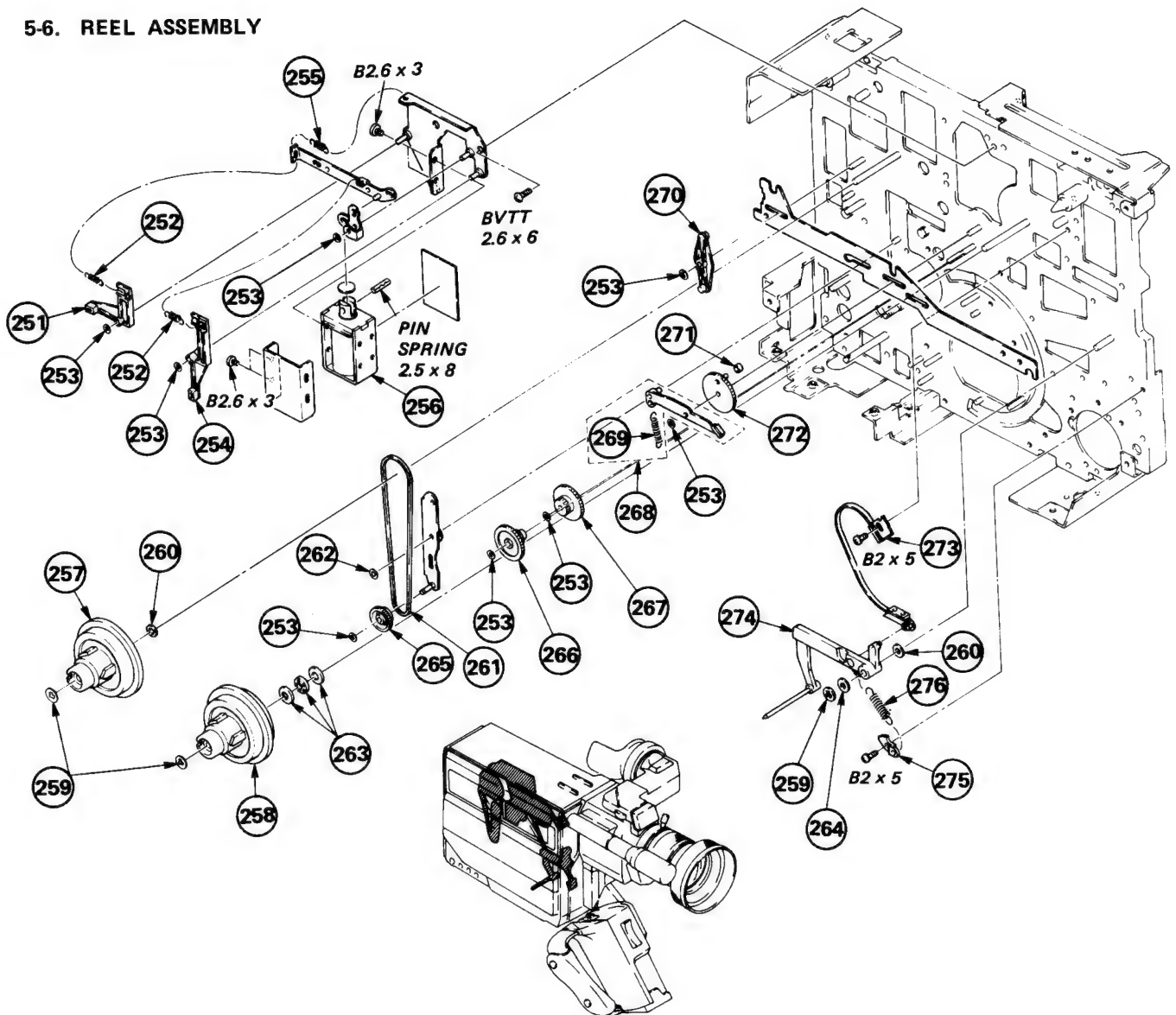


No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
201	3-669-596-00	WASHER (2.3), STOPPER		215	3-681-621-00	SPRING	
202	3-701-439-21	WASHER		216	A-6736-038-A	HEAD BLOCK ASSY, AC	217
203	▲:A-6747-230-A	ARM BLOCK ASSY, PINCH	204	217	3-669-615-00	SPRING, COMPRESSION	
204	3-536-786-00	SPRING, TENSION		218	8-825-561-10	HEAD, ERAZE (EF254-21)	
205	▲:X-3681-406-0	LEVER ASSY, PINCH PRESS		219	3-681-547-00	BRACKET, TRIPOD	
206	3-681-452-00	SPRING, TENSION		220	▲:3-681-809-00	RETAINER, PIN, ADJUSTMENT	
207	3-578-397-00	SPRING, TENSION		221	3-681-808-00	PIN, ADJUSTMENT	
208	3-669-465-00	WASHER (1.5), STOPPER		222	8-701-032-29	CT-3222	
209	A-6747-235-A	LEVER (E) BLOCK ASSY, EJECT	210	223	3-669-318-00	NUT, ADJUSTMENT, GUIDE	
210	3-547-667-00	SPRING, TENSION		224	1-562-325-00	SOCKET ASSY, IMAGE PICKUP TUBE	
211	A-6747-234-A	LEVER (G) BLOCK ASSY, RELEASE	212	225	3-701-439-21	WASHER	
212	3-535-346-00	SPRING, TENSION		226	3-570-615-11	POLY-WASHER (DIA.1.2)	
213	▲:1-454-357-21	SOLENOID, PLUNGER (PINCH) PM902		227	3-701-508-00	SET SCREW, DOUBLE POINT 3X6	
214	3-681-622-00	NUT, ADJUSTMENT, CTL HEAD					

NOTE:

The components identified by shading and mark ▲ are critical for safety. Replace only with part number specified.

5-6. REEL ASSEMBLY

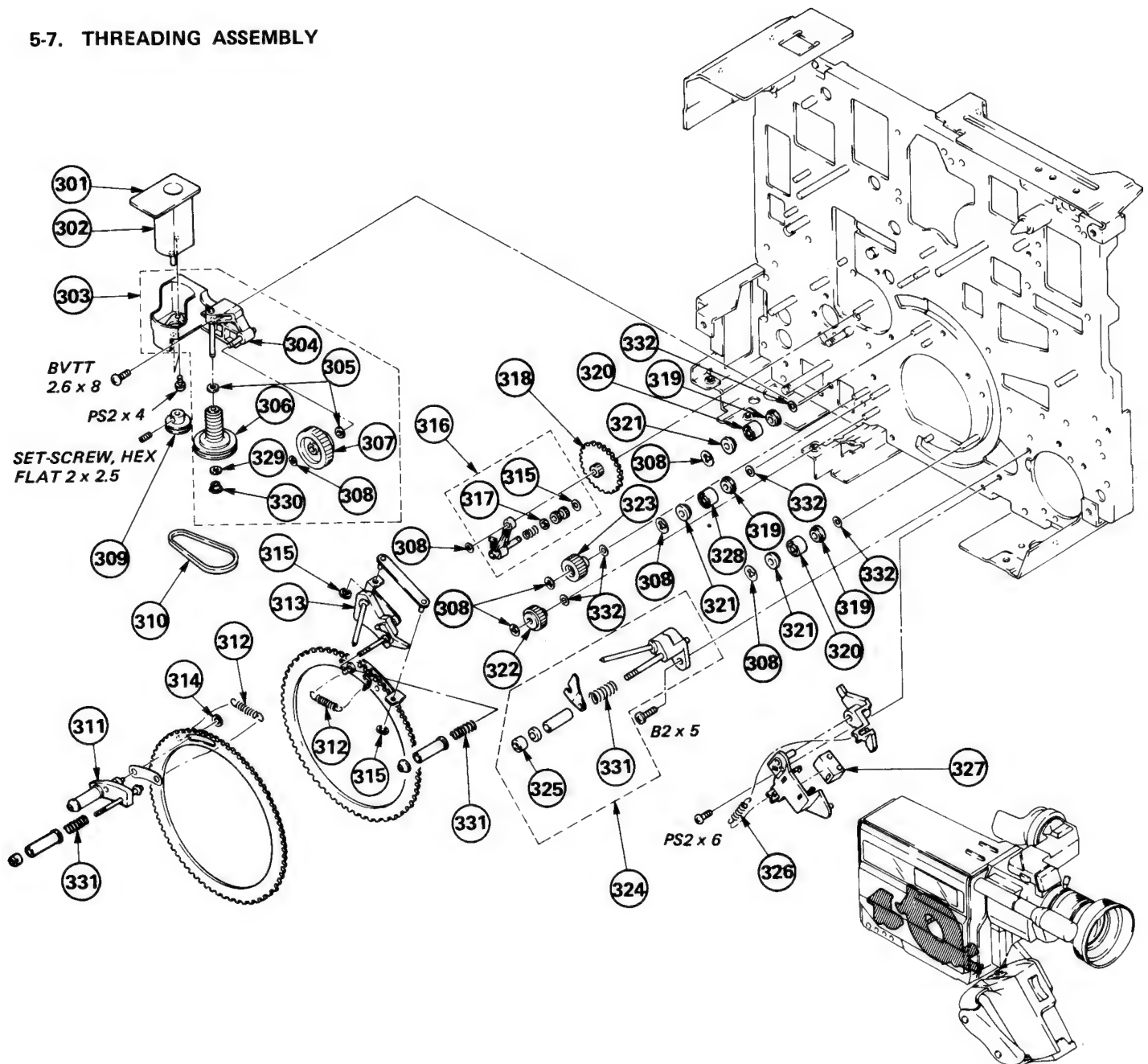


No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
251	A-6741-054-A	BRAKE ASSY, TAKE-UP		265	3-681-478-00	GEAR, FWD	
252	3-307-938-00	SPRING, TENSION		266	3-681-435-00	GEAR (B), DRIVING	
253	3-669-465-00	WASHER (1.5), STOPPER		267	3-681-434-00	GEAR (A), DRIVING	
254	A-6741-053-A	BRAKE ASSY, SUPPLY		268	A-6741-055-A	BRAKE ASSY, SOFT	269
255	3-527-025-00	SPRING, TENSION		269	3-672-461-00	SPRING, TENSION	
256	▲ 1-454-357-11	SOLENOID, PLUNGER (BRAKE) PM901		270	3-681-438-00	LEVER, PINCH CONVERSION	
257	X-3681-404-0	TABLE ASSY (TAKE-UP), REEL		271	▲ 3-681-443-00	ROLLER, DRIVING	
258	X-3681-405-0	TABLE ASSY (SUPPLY), REEL		272	3-681-436-00	GEAR (C), DRIVING	
259	3-669-596-00	WASHER (2.3), STOPPER		273	X-3681-410-0	BAND ASSY, TENSION REGULATOR	
260	3-701-439-21	WASHER		274	▲ X-3681-402-0	ARM ASSY, TENSION REGULATOR	
261	3-681-447-00	BELT, FWD		275	3-681-439-00	RETAINER, SPRING	
262	3-570-615-00	POLY-WASHER (DIA.1.2)		276	3-536-767-XX	SPRING, TENSION	
263	3-681-449-00	BEARING, THRUST					
264	3-701-439-21	WASHER					

NOTE:

The components identified by shading and mark ▲ are critical for safety. Replace only with part number specified.

5-7. THREADING ASSEMBLY



No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
301	▲:1-609-855-00	LM-12 BOARD		317	3-701-436-01	WASHER, 1.6	
302	8-835-098-01	MOTOR, DC (DNR-6600A) M901(LOADING)		318	3-681-437-00	GEAR (A), EJECT	
303	▲:A-6737-126-A	CASE BLOCK ASSY, MOTOR	304,305,306,307 308,329,330	319	3-681-433-00	ROLLER (C), RING GUIDE	
304	▲:X-3681-430-0	CASE ASSY, MOTOR		320	3-681-429-00	ROLLER (B), RING GUIDE	
305	3-701-437-21	WASHER		321	3-681-428-00	ROLLER (A), RING GUIDE	
306	▲:X-3681-429-0	GEAR ASSY, WORM		322	3-681-430-00	GEAR (S), LOADING	
307	▲:3-681-422-00	WHEEL, WORM		323	3-681-431-00	GEAR (T), LOADING	
308	3-669-465-00	WASHER (1.5), STOPPER		324	▲:A-6746-032-A	BASE BLOCK ASSY, TG1	325,331
309	3-681-423-00	PULLEY, MOTOR, LOADING		325	3-669-446-00	NUT, GUIDE, NO. 6	
310	3-681-424-00	BELT, LOADING		326	3-307-938-00	SPRING, TENSION	
311	▲:A-6750-151-A	BASE BLOCK ASSY, TG5	331	327	1-554-581-00	SWITCH, MICRO (LOADING END) S303	
312	3-564-935-00	SPRING, TENSION		328	3-681-674-00	ROLLER (D), GUIDE, RING	
313	▲:A-6746-033-A	BASE BLOCK ASSY, TG4	331	329	3-701-437-01	WASHER	
314	3-681-678-00	WASHER, STOPPER		330	3-703-075-00	CAP 2, SHAFT	
315	3-570-615-00	POLY-WASHER (DIA.1.2)		331	3-669-666-00	SPRING, COMPRESSION	
316	A-6747-233-A	ARM ASSY, EG	315,317	332	3-701-437-11	WASHER	

5-8. DRUM ASSEMBLY

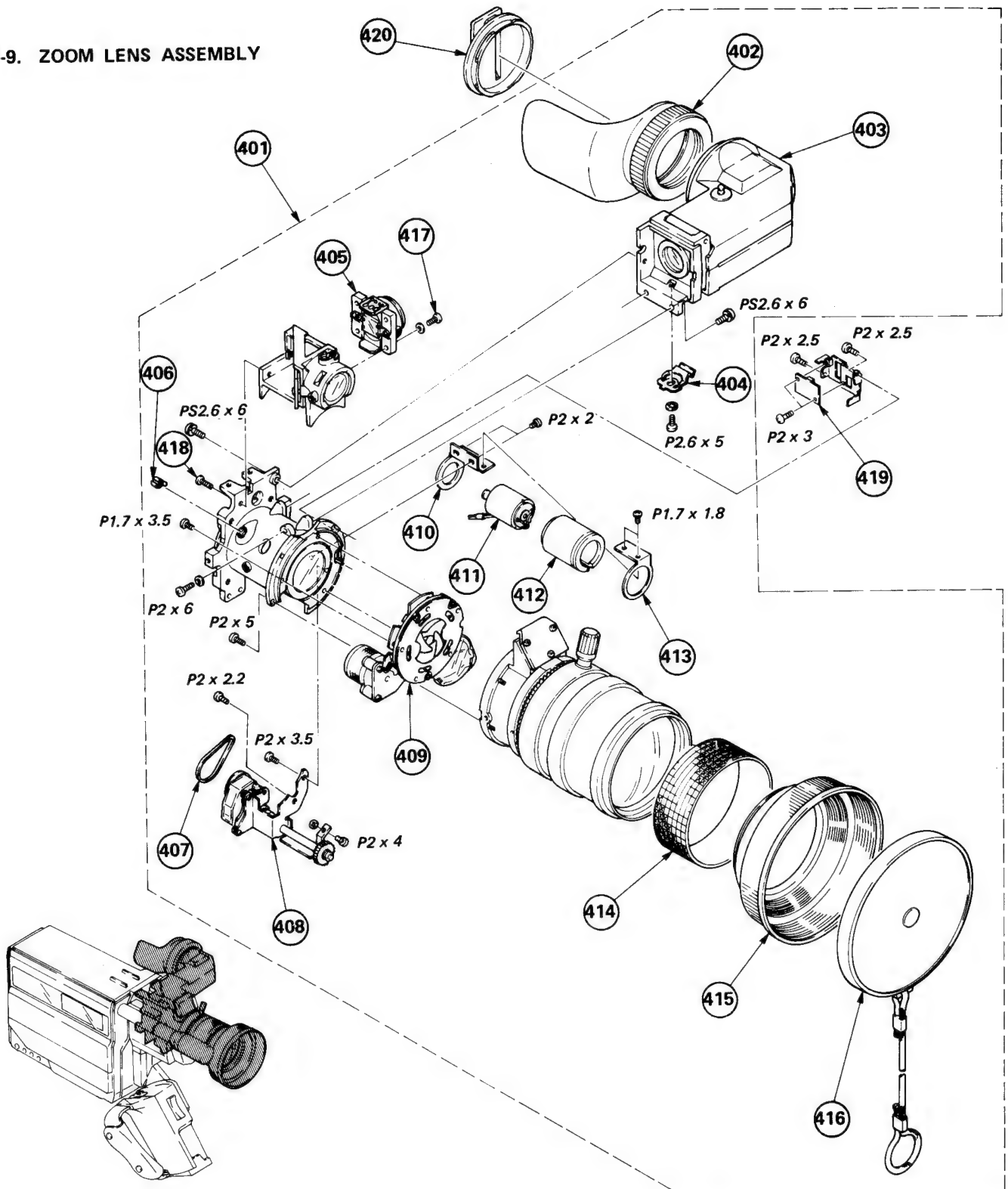
This diagram illustrates the assembly of the drum component. The main assembly is shown in the center, with various parts numbered 351 through 375. Key components and their specifications are labeled:

- 351**: B2 x 5
- 352**: PS2 x 10
- 353**: PS2 x 6
- 354**: WASHER
- 355**: PS 2 x 6
- 356**: PS2 x 6
- 357**: SCREW PRECISION P1.4 x 5
- 358**: SCREW PRECISION P1.4 x 5
- 359**: BVTT 2.6 x 6
- 360**: BVTT 2.6 x 6
- 361**: PS2 x 4
- 362**: SET-SCT, HEX 2.6 x 3
- 363**: SET-SCT, HEX 2.6 x 3
- 364**: SET-SCT HEX 2.6 x 3
- 365**: SET-SCT, HEX 2 x 2.5 FLAT
- 366**: SET-SCT, HEX 2 x 2.5 FLAT
- 367**: BVTT 2.6 x 6
- 368**: BVTT 2.6 x 6
- 369**: BVTT 2.6 x 6
- 370**: BVTT 2.6 x 6
- 371**: BVTT 2.6 x 6
- 372**: SPACER
- 373**: PS2 x 10
- 374**: PS2 x 6
- 375**: PS2 x 6

The diagram also shows a perspective view of the assembled drum at the bottom right.

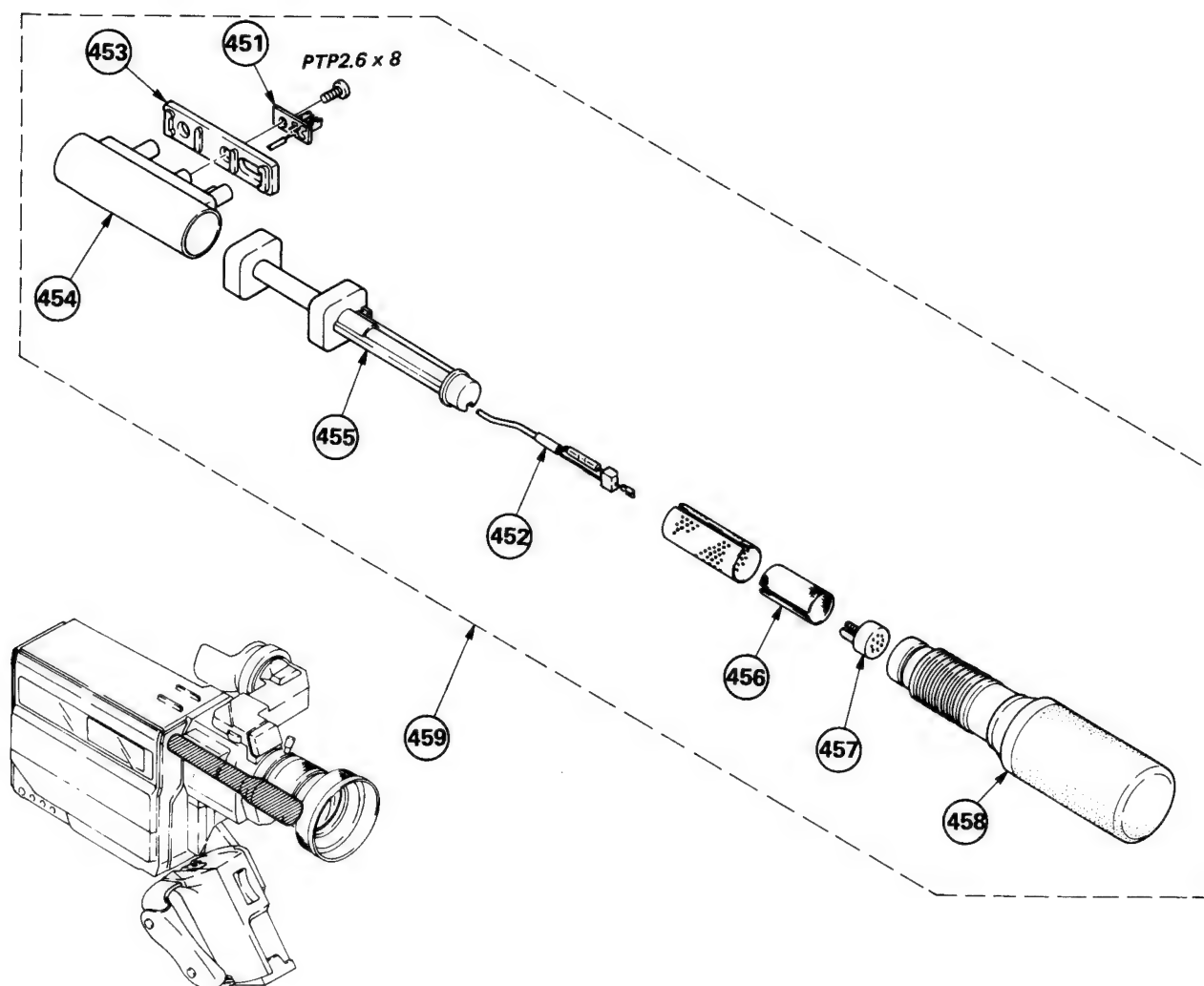
—100—

5-9. ZOOM LENS ASSEMBLY



No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
401	A-7613-052-A	LENS (VCL-906XA) ASSY, ZOOM	402-418	411	3-706-865-00	MOTOR ASSY, ZOOM	
402	3-706-869-00	CUP, EYE		412	3-706-861-00	RUBBER, VIBRATION PROOF	
403	3-706-868-00	EYEPiece ASSY		413	3-706-863-00	BRACKET B, Z MOTOR	
404	3-706-870-00	CLAW, ROCK		414	3-706-857-00	KNURL, FOCUS RUBBER	
405	3-706-871-00	SCREEN ASSY, LED		415	3-706-855-00	HOOD	
406	3-706-859-00	ADJUSTMENT PIECE, BF		416	3-706-856-00	CAP, HOOD	
407	3-706-860-00	BELT, Z		417	3-681-824-11	SCREW +P2X6	
408	3-706-864-00	GEAR ASSY, ZOOM		418	3-681-824-01	SCREW +P2X5	
409	3-706-858-00	FILTER ASSY, IRIS		419	1-610-553-00	FL-1 BOARD	
410	3-706-862-00	BRACKET A, Z MOTOR		420	3-681-823-00	COVER, EYECUP	

5-10. MICROPHONE ASSEMBLY



No.	Part No.	Description
451	♣:1-610-605-00	TRANSLATION BOARD
452	X-2532-703-0	FET ASSY
453	2-532-723-00	PACKING (A), RUBBER
454	2-532-726-00	CASE, MICROPHONE
455	♣:X-2532-705-0	JOINT ASSY

Remark	No.	Part No.	Description	Remark
	456	♣:2-532-717-00	MESH, SHIELD	
	457	8-814-173-01	MICROPHONE, BUILT-IN (CU11-01)	
	458	X-2532-704-0	SCREEN ASSY, WINDOW	
	459	8-814-165-01	MICROPHONE, BUILT-IN (C-2003)	451-458

HARDWARE LIST

SCREW

7-621-772-20 SCREW +B 2X5
7-621-775-00 SCREW +B 2.6X3
7-621-773-95 SCREW +B 2.6X6
7-682-550-09 SCREW +B 3X12
7-682-546-09 SCREW +B 3X5

7-685-862-01 SCREW +BVTT 2.6X6 (S)
7-685-863-01 SCREW +BVTT 2.6X8 (S)
7-621-591-00 SCREW +K 2X4
7-621-559-20 SCREW +K 2.6X4
7-621-592-00 SCREW +K 2.6X6

7-685-233-19 SCREW +KTP 2.6X6 TYPE2NON-SLIT
7-621-255-15 SCREW +P 2X3
7-621-255-25 SCREW +P 2X4
7-685-135-11 SCREW +P 2.6X10 TYPE2 NON-SLIT
7-621-259-15 SCREW +P 2.6X3

7-685-131-11 SCREW +P 2.6X4 TYPE2 NON-SLIT
7-685-134-11 SCREW +P 2.6X8 TYPE2 NON-SLIT
7-628-253-45 SCREW +PS 2X10
7-628-253-05 SCREW +PS 2X4
7-628-253-25 SCREW +PS 2X6

7-628-254-25 SCREW +PS 2.6X8
7-627-553-28 SCREW, PRECISION +P 2X2.5
7-627-851-27 SCREW, PRECISION +P 1.4X5
7-621-905-55 SCREW, TOTSU P 2X6
7-621-905-85 SCREW, TOTSU P 2X12

7-627-853-88 PRECISION SCREW +P 2X8 TYPE 3

SET-SCREW

7-621-712-45 SET-SCREW, SLOT 2.6X5CONE POINT
7-621-734-09 SET-SCT, HEX. 2.6X3
7-621-731-08 SET-SCT, HEX. 2X2.5, FLAT POINT

SPRING PIN

7-626-317-21 PIN, SPRING 2.5X8
7-626-308-31 SPRING PIN 1.4X8

STOP RING

7-624-102-04 STOP RING 1.5, TYPE -E
7-624-104-04 STOP RING 2.0, TYPE -E
7-624-105-04 STOP RING 2.3, TYPE -E
7-624-106-04 STOP RING 3.0, TYPE -E

WASHER

7-623-711-07 WASHER 20, WAVE
7-688-003-11 W 3, MIDDLE
7-623-420-07 LW 2, TYPE B
7-623-421-07 LW 2.6, TYPE B

BOLT

7-683-413-05 BOLT, HEXAGON SOCKET 2.6X8

PA-1**VC-2**

SECTION 6 ELECTRICAL PARTS LIST

NOTE:

The components identified by shading and mark **A** are critical for safety. Replace only with part number specified.

=>: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

Items marked "A" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

When indicating parts by reference number, please include the board name.

All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

CAPACITORS
MF : μ F, PF : μ PF

RESISTORS
All resistors are in ohms
F : nonflammable

COILS
MMH : mH, UH : μ H

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
	A-7511-947-A	PA-1 BOARD, COMPLETE *****		R807	1-216-053-00	METAL CHIP 1.5K 5%	1/10W
	1-610-551-11	PA-1 BOARD		R808	1-216-025-00	METAL CHIP 100 5%	1/10W
		<u>CAPACITOR</u>		R809	1-216-056-00	METAL CHIP 2K 5%	1/10W
C801	1-163-831-00	CERAMIC CHIP 0.047MF	10% 100V	R810	1-216-025-00	METAL CHIP 100 5%	1/10W
C802	1-131-380-00	TANTALUM 33MF	10% 10V	R811	1-216-064-00	METAL CHIP 4.3K 5%	1/10W
C803	1-124-222-00	ELECT 22MF	20% 6.3V				
C804	1-163-231-00	CERAMIC CHIP 15PF	5% 50V	R812	1-216-097-00	METAL CHIP 100K 5%	1/10W
C805	1-163-832-00	CERAMIC CHIP 0.1MF	10% 100V	R813	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
C806	1-124-224-00	ELECT 47MF	20% 6.3V	R814	1-216-036-00	METAL CHIP 300 5%	1/10W
C807	1-124-255-00	ELECT 1MF	20% 50V	R815	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
C808	1-131-380-00	TANTALUM 33MF	10% 10V	R816	1-216-073-00	METAL CHIP 10K 5%	1/10W
C809	1-163-125-00	CERAMIC CHIP 220PF	5% 50V				
C810	1-124-224-00	ELECT 47MF	20% 6.3V	R817	1-216-073-00	METAL CHIP 10K 5%	1/10W
				R818	1-216-036-00	METAL CHIP 300 5%	1/10W
C811	1-162-183-00	CERAMIC 0.047MF	300V	R819	1-216-056-00	METAL CHIP 2K 5%	1/10W
C812	1-163-019-00	CERAMIC CHIP 0.0068MF	10% 50V	R820	1-216-066-00	METAL CHIP 5.1K 5%	1/10W
		<u>CONNECTOR</u>		R821	1-216-097-00	METAL CHIP 100K 5%	1/10W
CN501	1-557-032-00	CONNECTOR ASSY (2.0MM) 5P				<u>TRANSFORMER</u>	
CN502	1-556-910-00	CONNECTOR ASSY (2.0MM) 5P		T801	1-437-126-21	TRANSFORMER, DRIVE	
CN801	1-564-016-00	PIN, CONNECTOR 6P				*****	
CN802	1-564-014-00	PIN, CONNECTOR 4P				A-7513-003-A	VC-2 BOARD, COMPLETE *****
		<u>TRIMMER</u>				3-662-075-00	COVER, CONTROL
CT801	1-141-245-00	TRIMMER, CERAMIC				3-681-826-00	CASE (MAIN), SHIELD, RA
		<u>COIL</u>				3-681-827-00	LID, SHIELD CASE, RA
L801	1-408-939-00	COIL, PERSEVERE (151UH)				3-681-830-00	CASE (MAIN), SHIELD, SG
L802	1-408-948-00	MICRO INDUCTOR 220UH				3-681-831-00	LID, SHIELD CASE, SG
L803	1-408-948-00	MICRO INDUCTOR 220UH					
L804	1-408-948-00	MICRO INDUCTOR 220UH				3-681-832-00	SHEET (A), INSULATING, SG
		<u>TRANSISTOR</u>				3-681-834-00	CUSHION, RUBBER
Q801	8-729-130-03	TRANSISTOR 2SK300				9-911-839-XX	CUSHION (2X2), RUBBER
Q802	8-729-122-63	TRANSISTOR 2SA1226-E4				<u>PIN</u>	
Q803	8-729-102-08	TRANSISTOR 2SC2223-F14		BP501	1-564-317-00	PIN, BOARD TO BOARD 5P	
Q804	8-729-122-63	TRANSISTOR 2SA1226-E4		BP502	1-564-318-00	PIN, BOARD TO BOARD 10P	
Q805	8-729-102-08	TRANSISTOR 2SC2223-F14		BP503	1-564-317-00	PIN, BOARD TO BOARD 5P	
				BP504	1-564-318-00	PIN, BOARD TO BOARD 10P	
Q806	8-729-100-66	TRANSISTOR 2SC1623				<u>CONNECTOR</u>	
Q807	8-729-102-66	TRANSISTOR 2SC1623		C001	1-123-622-00	ELECT 22MF	20% 16V
Q808	8-729-102-66	TRANSISTOR 2SC1623		C017	1-163-124-00	CERAMIC CHIP 200PF	5% 50V
Q809	8-729-100-66	TRANSISTOR 2SC1623		C018	1-163-080-00	CERAMIC CHIP 0.047MF	10% 25V
Q810	8-729-100-66	TRANSISTOR 2SC1623		C019	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V
		<u>RESISTOR</u>		C020	1-163-080-00	CERAMIC CHIP 0.047MF	10% 25V
R801	1-208-259-00	RES, MICRO (HIGH MEGA OHM) 10M					
R802	1-216-277-00	METAL CHIP 2M 5%	1/8W	C021	1-123-645-00	ELECT 33MF	20% 10V
R803	1-216-038-00	METAL CHIP 360 5%	1/10W	C023	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V
R804	1-216-053-00	METAL CHIP 1.5K 5%	1/10W	C024	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V
R805	1-216-082-00	METAL CHIP 24K 5%	1/10W	C025	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V
				C026	1-163-231-00	CERAMIC CHIP 15PF	5% 50V
R806	1-216-082-00	METAL CHIP 24K 5%	1/10W				
				C028	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V
				C029	1-163-080-00	CERAMIC CHIP 0.047MF	10% 25V
				C030	1-123-645-00	ELECT 33MF	20% 10V
				C031	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V
				C032	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
C033	1-123-645-00	ELECT 33MF	20% 10V	C513	1-123-647-00	ELECT 47MF	20% 6.3V
C034	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V	C514	1-163-080-00	CERAMIC CHIP 0.047MF	10% 25V
C035	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V	C515	1-124-233-00	ELECT 10MF	20% 16V
C036	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V	C516	1-123-822-00	ELECT 47MF	20% 10V
C037	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V	C518	1-163-124-00	CERAMIC CHIP 200PF	5% 50V
C038	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V	C521	1-123-822-00	ELECT 47MF	20% 10V
C039	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V	C523	1-124-233-00	ELECT 10MF	20% 16V
C040	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V	C524	1-163-114-00	CERAMIC CHIP 75PF	5% 50V
C041	1-163-080-00	CERAMIC CHIP 0.047MF	10% 25V	C525	1-163-114-00	CERAMIC CHIP 75PF	5% 50V
C042	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V	C526	1-163-121-00	CERAMIC CHIP 150PF	5% 50V
C043	1-124-231-00	ELECT 4.7MF	20% 16V	C527	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V
C044	1-163-080-00	CERAMIC CHIP 0.047MF	10% 25V	C528	1-163-009-00	CERAMIC CHIP 0.001MF	10% 50V
C045	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V	C529	1-163-009-00	CERAMIC CHIP 0.001MF	10% 50V
C046	1-163-080-00	CERAMIC CHIP 0.047MF	10% 25V	C530	1-163-243-00	CERAMIC CHIP 47PF	5% 50V
C047	1-163-077-00	CERAMIC CHIP 0.1MF	50V	C531	1-163-242-00	CERAMIC CHIP 43PF	5% 50V
C048	1-123-822-00	ELECT 47MF	20% 10V	C532	1-163-104-00	CERAMIC CHIP 30PF	5% 50V
C050	1-163-233-00	CERAMIC CHIP 18PF	5% 50V	C533	1-163-009-00	CERAMIC CHIP 0.001MF	10% 50V
C051	1-163-009-00	CERAMIC CHIP 0.001MF	10% 50V	C534	1-163-080-00	CERAMIC CHIP 0.047MF	10% 25V
C052	1-163-081-00	CERAMIC CHIP 0.22MF	25V	C535	1-131-371-00	TANTALUM 10MF	10% 16V
C053	1-163-081-00	CERAMIC CHIP 0.22MF	25V	C536	1-123-645-00	ELECT 33MF	20% 10V
C054	1-163-220-91	CERAMIC CHIP 3PF	0.25PF 50V	C537	1-163-080-00	CERAMIC CHIP 0.047MF	10% 25V
C055	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V	C538	1-163-009-00	CERAMIC CHIP 0.001MF	10% 50V
C056	1-163-103-00	CERAMIC CHIP 27PF	5% 50V	C539	1-163-009-00	CERAMIC CHIP 0.001MF	10% 50V
C057	1-163-013-00	CERAMIC CHIP 0.0022MF	10% 50V	C540	1-163-009-00	CERAMIC CHIP 0.001MF	10% 50V
C058	1-163-080-00	CERAMIC CHIP 0.047MF	10% 25V	C541	1-163-240-00	CERAMIC CHIP 36PF	5% 50V
C059	1-163-123-00	CERAMIC CHIP 180PF	5% 50V	C542	1-163-246-00	CERAMIC CHIP 62PF	5% 50V
C061	1-131-377-00	TANTALUM 10MF	20% 10V	C543	1-163-081-00	CERAMIC CHIP 0.22MF	25V
C063	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V	C544	1-163-081-00	CERAMIC CHIP 0.22MF	25V
C151	1-163-229-00	CERAMIC CHIP 12PF	5% 50V	C545	1-125-299-00	***** 47000MF	5V
C152	1-163-077-00	CERAMIC CHIP 0.1MF	50V	C548	1-131-371-00	TANTALUM 10MF	10% 16V
C153	1-163-255-00	CERAMIC CHIP 150PF	5% 50V	C549	1-131-371-00	TANTALUM 10MF	10% 16V
C154	1-163-265-91	CERAMIC CHIP 390PF	5% 50V	C552	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V
C155	1-163-269-00	CERAMIC CHIP 560PF	5% 50V	C554	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V
C156	1-163-077-00	CERAMIC CHIP 0.1MF	50V	C557	1-124-233-00	ELECT 10MF	20% 16V
C157	1-163-077-00	CERAMIC CHIP 0.1MF	50V	C558	1-163-123-00	CERAMIC CHIP 180PF	5% 50V
C158	1-163-236-91	CERAMIC CHIP 24PF	5% 50V	C559	1-130-476-00	MYLAR 0.0027MF	5% 50V
C159	1-163-077-00	CERAMIC CHIP 0.1MF	50V	C560	1-163-080-00	CERAMIC CHIP 0.047MF	10% 25V
C160	1-163-080-00	CERAMIC CHIP 0.047MF	10% 25V	C561	1-131-346-00	TANTALUM 0.68MF	10% 35V
C161	1-163-080-00	CERAMIC CHIP 0.047MF	10% 25V	C562	1-123-622-00	ELECT 22MF	20% 16V
C162	1-163-077-00	CERAMIC CHIP 0.1MF	50V	C563	1-131-371-00	TANTALUM 10MF	10% 16V
C163	1-124-169-00	ELECT 100MF	20% 10V	C564	1-124-233-00	ELECT 10MF	20% 16V
C501	1-131-380-00	TANTALUM 33MF	10% 10V	C565	1-124-233-00	ELECT 10MF	20% 16V
C502	1-131-387-00	TANTALUM 47MF	10% 6.3V	C566	1-131-408-00	TANTALUM 1MF	10% 25V
C503	1-124-233-00	ELECT 10MF	20% 16V	C567	1-163-035-00	CERAMIC CHIP 0.047MF	50V
C504	1-123-645-00	ELECT 33MF	20% 10V	C568	1-123-647-00	ELECT 47MF	20% 6.3V
C505	1-163-080-00	CERAMIC CHIP 0.047MF	10% 25V	C569	1-131-391-00	TANTALUM 22MF	20% 3.15V
C506	1-123-647-00	ELECT 47MF	20% 6.3V	C570	1-124-169-00	ELECT 100MF	20% 10V
C507	1-124-233-00	ELECT 10MF	20% 16V	C572	1-163-011-00	CERAMIC CHIP 0.0015MF	10% 50V
C508	1-163-117-00	CERAMIC CHIP 100PF	5% 50V	C573	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V
C509	1-123-647-00	ELECT 47MF	20% 6.3V	C574	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V
C510	1-163-080-00	CERAMIC CHIP 0.047MF	10% 25V	C575	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V
C511	1-163-013-00	CERAMIC CHIP 0.0022MF	10% 50V	C576	1-123-661-00	ELECT 100MF	20% 6.3V
C512	1-163-080-00	CERAMIC CHIP 0.047MF	10% 25V	C579	1-124-233-00	ELECT 10MF	20% 16V

When indicating parts by reference number, please include the board name.

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Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
C583	1-124-233-00	ELECT 10MF	20% 16V	C734	1-131-381-00	TANTALUM 47MF	20% 10V
C586	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V	C735	1-131-388-00	TANTALUM 68MF	20% 6.3V
C587	1-163-132-00	CERAMIC CHIP 430PF	5% 50V	C736	1-131-395-00	TANTALUM 100MF	10% 3.15V
C588	1-163-124-00	CERAMIC CHIP 200PF	5% 50V	C738	1-163-080-00	CERAMIC CHIP 0.047MF	10% 25V
C590	1-163-080-00	CERAMIC CHIP 0.047MF	10% 25V	C741	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V
C591	1-163-004-00	CERAMIC CHIP 390PF	10% 50V	C742	1-163-831-00	CERAMIC CHIP 0.047MF	10% 100V
C592	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V	C852	1-163-109-00	CERAMIC CHIP 47PF	5% 50V
C593	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V	C853	1-163-230-00	CERAMIC CHIP 13P	5% 50V
C594	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V	C858	1-163-109-00	CERAMIC CHIP 47PF	5% 50V
C595	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V	C859	1-163-109-00	CERAMIC CHIP 47PF	5% 50V
C596	1-163-115-00	CERAMIC CHIP 82PF	5% 50V	C860	1-163-009-00	CERAMIC CHIP 0.001MF	10% 50V
C597	1-163-104-00	CERAMIC CHIP 30PF	5% 50V	C861	1-163-109-00	CERAMIC CHIP 47PF	5% 50V
C598	1-163-115-00	CERAMIC CHIP 82PF	5% 50V	C863	1-163-109-00	CERAMIC CHIP 47PF	5% 50V
C599	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V	C871	1-124-140-00	ELECT 220MF	20% 10V
C600	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V	C872	1-163-080-00	CERAMIC CHIP 0.047MF	10% 25V
C603	1-163-081-00	CERAMIC CHIP 0.22MF	25V	C873	1-131-385-00	TANTALUM 22MF	20% 6.3V
C652	1-163-126-00	CERAMIC CHIP 240PF	5% 50V	C874	1-163-009-00	CERAMIC CHIP 0.001MF	10% 50V
C660	1-123-617-00	ELECT 10MF	20% 16V	C875	1-131-341-00	TANTALUM 0.1MF	20% 35V
C661	1-163-081-00	CERAMIC CHIP 0.22MF	25V	CONNECTOR			
C662	1-124-233-00	ELECT 10MF	20% 16V	CN001	1-564-004-00	PIN, CONNECTOR 5P	
C663	1-163-109-00	CERAMIC CHIP 47PF	5% 50V	CN002	1-564-005-00	PIN, CONNECTOR 6P	
C701	1-131-395-00	TANTALUM 100MF	10% 3.15V	CN501	1-564-004-00	PIN, CONNECTOR 5P	
C702	1-163-019-00	CERAMIC CHIP 0.0068MF	10% 50V	CN502	1-564-004-00	PIN, CONNECTOR 5P	
C703	1-163-080-00	CERAMIC CHIP 0.047MF	10% 25V	CN503	1-564-003-00	PIN, CONNECTOR 4P	
C704	1-123-622-00	ELECT 22MF	20% 16V	CN504	1-564-001-11	PIN, CONNECTOR 2P	
C705	1-124-255-00	ELECT 1MF	20% 50V	CN505	1-564-008-00	PIN, CONNECTOR 9P	
C706	1-124-243-11	ELECT 2.2MF	20% 35V	CN506	1-564-004-00	PIN, CONNECTOR 5P	
C707	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V	CN507	1-564-002-00	PIN, CONNECTOR 3P	
C708	1-123-619-00	ELECT 4.7MF	20% 50V	CN508	1-564-001-11	PIN, CONNECTOR 2P	
C709	1-123-367-00	ELECT 2.2MF	20% 63V	CN509	1-564-009-00	PIN, CONNECTOR 10P	
C710	1-163-121-00	CERAMIC CHIP 150PF	5% 50V	CN510	1-564-187-00	PIN, CONNECTOR	
C711	1-131-393-00	TANTALUM 47MF	10% 3.15V	CN851	1-564-002-00	PIN, CONNECTOR 3P	
C712	1-123-380-00	ELECT 1MF	20% 100V	TRIMMER			
C713	1-106-196-00	MYLAR 0.01MF	5% 100V	CT851	1-141-260-00	CAP, TRIMMER 50PF	
C714	1-106-196-00	MYLAR 0.01MF	5% 100V	DIODE			
C715	1-107-036-00	MICA 68PF	5% 500V	D005	8-719-100-05	DIODE 1S2837	
C716	1-107-036-00	MICA 68PF	5% 500V	D006	8-719-100-03	DIODE 1S2835	
C717	1-163-107-00	CERAMIC CHIP 39PF	5% 50V	D007	8-719-910-64	DIODE HZ6B1L	
C718	1-163-107-00	CERAMIC CHIP 39PF	5% 50V	D151	8-719-101-23	DIODE 1SS123	
C719	1-106-367-00	MYLAR 0.01MF	5% 200V	D152	8-719-921-20	DIODE 1SS119TD	
C720	1-124-233-00	ELECT 10MF	20% 16V	D153	8-719-101-23	DIODE 1SS123	
C721	1-108-427-00	MYLAR 0.033MF	10% 200V	D501	8-719-101-23	DIODE 1SS123	
C722	1-108-427-00	MYLAR 0.033MF	10% 200V	D502	8-719-100-05	DIODE 1S2837	
C723	1-108-425-00	MYLAR 0.022MF	5% 200V	D503	8-719-921-20	DIODE 1SS119TD	
C724	1-123-647-00	ELECT 47MF	20% 6.3V	D504	8-719-101-23	DIODE 1SS123	
C725	1-123-661-00	ELECT 100MF	20% 6.3V	D505	8-719-101-23	DIODE 1SS123	
C727	1-123-647-00	ELECT 47MF	20% 6.3V	D506	8-719-100-03	DIODE 1S2835	
C728	1-163-080-00	CERAMIC CHIP 0.047MF	10% 25V	D507	8-719-100-05	DIODE 1S2837	
C729	1-163-080-00	CERAMIC CHIP 0.047MF	10% 25V	D508	8-719-100-03	DIODE 1S2835	
C730	1-163-080-00	CERAMIC CHIP 0.047MF	10% 25V				
C731	1-131-395-00	TANTALUM 100MF	10% 3.15V				
C732	1-131-387-00	TANTALUM 47MF	10% 6.3V				
C733	1-123-026-00	ELECT 2.2MF	160V				

When indicating parts by reference number, please include the board name.

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
D511	8-719-921-20	DIODE 1SS119TD		L506	1-408-022-00	MICRO INDUCTOR 27UH	
D514	=>8-719-100-15	DIODE RD3.0EB-B2		L507	1-408-595-00	MICRO INDUCTOR 2.2UH	
D515	8-719-921-20	DIODE 1SS119TD		L508	1-408-936-00	MICRO INDUCTOR 6.8UH	
D518	8-719-921-20	DIODE 1SS119TD		L509	1-408-462-11	MICRO INDUCTOR 470UH	
D519	8-719-100-03	DIODE 1S2835		L510	1-408-462-11	MICRO INDUCTOR 470UH	
D656	8-719-100-03	DIODE 1S2835		L512	1-421-421-00	COIL, CHOKE 100UH	
D701	8-719-921-20	DIODE 1SS119TD		L513	1-408-618-00	MICRO INDUCTOR 180UH	
D704	8-719-921-20	DIODE 1SS119TD		L514	1-408-622-00	MICRO INDUCTOR 390UH	
D705	8-719-921-20	DIODE 1SS119TD		L515	1-408-990-00	MICRO INDUCTOR 120UH	
D706	=>8-719-106-18	DIODE RD6.8M-B3		L651	1-408-613-00	MICRO INDUCTOR 68UH	
D707	8-719-101-23	DIODE 1SS123		L854	1-408-956-00	COIL, CHOKE	
D851	A 8-719-154-51	DIODE RD5.1E-L1					
<u>DELAY LINE</u>				<u>TRANSISTOR</u>			
DL501	1-415-329-00	DELAY LINE		Q001	8-729-100-66	TRANSISTOR 2SC1623	
DL502	1-415-331-00	DELAY LINE		Q002	8-729-100-66	TRANSISTOR 2SC1623	
DL503	1-415-349-00	DELAY LINE, 1H		Q003	8-729-312-22	TRANSISTOR 2SA1122	
<u>FILTER</u>				Q014	8-729-102-08	TRANSISTOR 2SC2223-F14	
FL501	1-235-234-00	ENCAPSULATED COMPONENT		Q016	8-729-122-63	TRANSISTOR 2SA1226-E4	
<u>CONVERTER</u>				Q017	8-729-122-63	TRANSISTOR 2SA1226-E4	
HV701	A 1-464-275-00	CONVERTER BLOCK, DC-DC		Q018	8-729-312-22	TRANSISTOR 2SA1122	
<u>IC</u>				Q019	8-729-100-66	TRANSISTOR 2SC1623	
IC002	8-759-600-49	IC CX20004		Q020	8-729-100-76	TRANSISTOR 2SA812	
IC501	8-759-920-02	IC CX10002		Q021	8-729-100-66	TRANSISTOR 2SC1623	
IC502	8-758-960-00	IC CX896		Q022	8-729-100-66	TRANSISTOR 2SC1623	
IC505	8-758-160-00	IC CX816		Q023	8-729-100-66	TRANSISTOR 2SC1623	
IC506	8-759-600-40	IC CX10041		Q024	8-729-100-66	TRANSISTOR 2SC1623	
IC507	8-741-116-71	IC BX1167A		Q025	8-729-100-66	TRANSISTOR 2SC1623	
IC509	8-759-906-39	IC CX20059		Q026	8-729-100-66	TRANSISTOR 2SC1623	
IC510	8-759-700-45	IC NJM4556M-A		Q027	8-729-100-66	TRANSISTOR 2SC1623	
IC701	8-741-117-10	IC BX1171		Q028	8-729-100-66	TRANSISTOR 2SC1623	
IC702	8-741-117-10	IC BX1171		Q029	8-729-101-25	TRANSISTOR 2SC1009A	
IC703	8-759-100-96	IC UPC4558G2		Q030	8-729-101-25	TRANSISTOR 2SC1009A	
IC704	8-759-100-96	IC UPC4558G2		Q031	8-729-101-25	TRANSISTOR 2SC1009A	
IC851	8-759-908-54	IC CX7986		Q032	8-729-101-25	TRANSISTOR 2SC1009A	
IC852	8-759-100-96	IC UPC4558G2		Q033	8-729-101-25	TRANSISTOR 2SC1009A	
<u>COIL</u>				Q034	8-729-100-76	TRANSISTOR 2SA812	
L002	1-408-423-00	MICRO INDUCTOR 150UH		Q035	8-729-100-76	TRANSISTOR 2SA812	
L003	1-408-609-00	MICRO INDUCTOR 33UH		Q036	8-729-100-66	TRANSISTOR 2SC1623	
L004	1-408-410-00	MICRO INDUCTOR 12UH		Q037	8-729-100-66	TRANSISTOR 2SC1623	
L007	1-406-067-00	COIL, RF		Q151	8-729-100-76	TRANSISTOR 2SA812	
L008	1-406-067-00	COIL, RF		Q152	8-729-100-66	TRANSISTOR 2SC1623	
L151	1-408-422-00	MICRO INDUCTOR 120UH		Q153	8-729-100-66	TRANSISTOR 2SC1623	
L152	1-408-408-00	MICRO INDUCTOR 8.2UH		Q154	8-729-100-76	TRANSISTOR 2SA812	
L502	1-408-602-00	MICRO INDUCTOR 8.2UH		Q155	8-729-100-66	TRANSISTOR 2SC1623	
L503	1-408-936-00	MICRO INDUCTOR 6.8UH		Q156	8-729-271-23	TRANSISTOR 2SC2712	
L504	1-407-927-00	COIL, VARIABLE 10UH		Q157	8-729-100-66	TRANSISTOR 2SC1623	
L505	1-408-021-00	MICRO INDUCTOR 150UH		Q158	8-729-312-22	TRANSISTOR 2SA1122	
				Q159	8-729-100-66	TRANSISTOR 2SC1623	
				Q160	8-729-100-66	TRANSISTOR 2SC1623	
				Q161	8-729-100-76	TRANSISTOR 2SA812	
				Q501	8-729-100-66	TRANSISTOR 2SC1623	
				Q502	8-729-100-66	TRANSISTOR 2SC1623	
				Q503	8-729-122-63	TRANSISTOR 2SA1226-E4	

NOTE:

The components identified by shading and mark **A** are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

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Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
Q504	8-729-100-76	TRANSISTOR 2SA812		R029	1-216-086-00	METAL CHIP 36K 5%	1/10W
Q505	8-729-100-76	TRANSISTOR 2SA812		R042	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
Q506	8-729-100-66	TRANSISTOR 2SC1623		R043	1-216-040-00	METAL CHIP 430 5%	1/10W
Q507	8-729-100-66	TRANSISTOR 2SC1623		R044	1-216-049-00	METAL CHIP 1K 5%	1/10W
Q509	8-729-100-66	TRANSISTOR 2SC1623		R045	1-216-046-00	METAL CHIP 750 5%	1/10W
Q510	8-729-100-66	TRANSISTOR 2SC1623		R046	1-216-092-00	METAL CHIP 62K 5%	1/10W
Q511	8-729-100-66	TRANSISTOR 2SC1623		R047	1-216-024-00	METAL CHIP 91 5%	1/10W
Q512	8-729-100-66	TRANSISTOR 2SC1623		R048	1-216-049-00	METAL CHIP 1K 5%	1/10W
Q515	8-729-102-76	TRANSISTOR 2SA812-T2M6		R049	1-216-083-00	METAL CHIP 27K 5%	1/10W
Q516	8-729-100-76	TRANSISTOR 2SA812		R050	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
Q517 =>	8-729-220-92	TRANSISTOR 2SK209Y		R051	1-216-085-00	METAL CHIP 33K 5%	1/10W
Q518 =>	8-729-220-92	TRANSISTOR 2SK209Y		R052	1-216-082-00	METAL CHIP 24K 5%	1/10W
Q519	8-729-100-76	TRANSISTOR 2SA812		R053	1-216-051-00	METAL CHIP 1.2K 5%	1/10W
Q520	8-729-100-76	TRANSISTOR 2SA812		R054	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
Q521	8-729-100-76	TRANSISTOR 2SA812		R055	1-216-075-00	METAL CHIP 12K 5%	1/10W
Q522	8-729-100-66	TRANSISTOR 2SC1623		R056	1-216-049-00	METAL CHIP 1K 5%	1/10W
Q523	8-729-100-66	TRANSISTOR 2SC1623		R057	1-216-089-00	METAL CHIP 47K 5%	1/10W
Q524	8-729-100-76	TRANSISTOR 2SA812		R058	1-216-029-00	METAL CHIP 150 5%	1/10W
Q527	8-729-100-66	TRANSISTOR 2SC1623		R059	1-215-389-00	METAL 47 1%	1/6W
Q528	8-729-100-66	TRANSISTOR 2SC1623		R060	1-216-032-00	METAL CHIP 200 5%	1/10W
Q529	8-729-102-26	TRANSISTOR 2SC1623-T2L6		R061	1-216-081-00	METAL CHIP 22K 5%	1/10W
Q530	8-729-100-66	TRANSISTOR 2SC1623		R062	1-216-049-00	METAL CHIP 1K 5%	1/10W
Q531	8-729-102-26	TRANSISTOR 2SC1623-T2L6		R063	1-216-313-00	METAL CHIP 8.2 5%	1/10W
Q652	8-729-202-57	TRANSISTOR 2SC3381		R064	1-216-089-00	METAL CHIP 47K 5%	1/10W
Q701	8-729-100-66	TRANSISTOR 2SC1623		R065	1-216-089-00	METAL CHIP 47K 5%	1/10W
Q702	8-729-100-66	TRANSISTOR 2SC1623		R066	1-216-089-00	METAL CHIP 47K 5%	1/10W
Q703 A	8-729-104-08	TRANSISTOR 2SD0999		R067	1-216-089-00	METAL CHIP 47K 5%	1/10W
Q704	8-729-100-76	TRANSISTOR 2SA812		R068	1-216-063-00	METAL CHIP 3.9K 5%	1/10W
Q705 A	8-729-104-02	TRANSISTOR 2SB798		R069	1-216-066-00	METAL CHIP 5.1K 5%	1/10W
Q706	8-729-100-66	TRANSISTOR 2SC1623		R070	1-216-097-00	METAL CHIP 100K 5%	1/10W
Q707	8-729-100-66	TRANSISTOR 2SC1623		R071	1-216-097-00	METAL CHIP 100K 5%	1/10W
Q708	8-729-271-32	TRANSISTOR 2SC2713		R072	1-216-043-00	METAL CHIP 560 5%	1/10W
Q710	8-729-271-32	TRANSISTOR 2SC2713		R073	1-216-043-00	METAL CHIP 560 5%	1/10W
Q711	8-729-216-32	TRANSISTOR 2SA1163		R074	1-216-066-00	METAL CHIP 5.1K 5%	1/10W
Q712 A	8-729-104-02	TRANSISTOR 2SB798		R075	1-216-063-00	METAL CHIP 3.9K 5%	1/10W
Q713	8-729-100-66	TRANSISTOR 2SC1623		R076	1-216-073-00	METAL CHIP 10K 5%	1/10W
Q714	8-729-100-66	TRANSISTOR 2SC1623		R077	1-216-085-00	METAL CHIP 33K 5%	1/10W
Q715	8-729-100-76	TRANSISTOR 2SA812		R078	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
Q716	8-729-200-17	TRANSISTOR 2SA1091		R079	1-216-085-00	METAL CHIP 33K 5%	1/10W
Q717	8-729-271-32	TRANSISTOR 2SC2713		R080	1-216-085-00	METAL CHIP 33K 5%	1/10W
Q718	8-729-271-32	TRANSISTOR 2SC2713		R081	1-216-073-00	METAL CHIP 10K 5%	1/10W
Q719	8-729-271-32	TRANSISTOR 2SC2713		R082	1-216-001-00	METAL CHIP 10 5%	1/10W
Q720	8-729-216-32	TRANSISTOR 2SA1163		R083	1-216-049-00	METAL CHIP 1K 5%	1/10W
Q852 A	8-729-102-26	TRANSISTOR 2SC1623		R084	1-216-085-00	METAL CHIP 33K 5%	1/10W
RESISTOR				R085	1-216-079-00	METAL CHIP 18K 5%	1/10W
R001	1-216-113-00	METAL CHIP 470K 5%	1/10W	R086	1-216-093-00	METAL CHIP 68K 5%	1/10W
R003	1-216-053-00	METAL CHIP 1.5K 5%	1/10W	R087	1-216-081-00	METAL CHIP 22K 5%	1/10W
R004	1-216-067-00	METAL CHIP 5.6K 5%	1/10W	R088	1-216-042-00	METAL CHIP 510 5%	1/10W
R005	1-216-070-00	METAL CHIP 7.5K 5%	1/10W	R089	1-216-029-00	METAL CHIP 150 5%	1/10W
R006	1-216-049-00	METAL CHIP 1K 5%	1/10W	R090	1-216-303-91	METAL CHIP 3 5%	1/10W
R012	1-216-025-00	METAL CHIP 100 5%	1/10W	R091	1-216-085-00	METAL CHIP 33K 5%	1/10W
R013	1-216-018-00	METAL CHIP 51 5%	1/10W	R092	1-216-089-00	METAL CHIP 47K 5%	1/10W
				R093	1-216-085-00	METAL CHIP 33K 5%	1/10W

NOTE:

The components identified by shading and mark A are critical for safety. Replace only with part number specified.

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Ref.No.	Part No.	Description				Remark	Ref.No.	Part No.	Description				Remark
R094	1-216-085-00	METAL CHIP	33K	5%	1/10W		R180	1-216-047-00	METAL CHIP	820	5%	1/10W	
R095	1-216-089-00	METAL CHIP	47K	5%	1/10W		R181	1-216-074-00	METAL CHIP	11K	5%	1/10W	
R096	1-216-057-00	METAL CHIP	2.2K	5%	1/10W		R182	1-216-060-00	METAL CHIP	3K	5%	1/10W	
R097	1-216-069-00	METAL CHIP	6.8K	5%	1/10W		R183	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R098	1-216-073-00	METAL CHIP	10K	5%	1/10W		R184	1-216-060-00	METAL CHIP	3K	5%	1/10W	
R099	1-216-061-00	METAL CHIP	3.3K	5%	1/10W		R185	1-216-025-00	METAL CHIP	100	5%	1/10W	
R100	1-216-101-00	METAL CHIP	150K	5%	1/10W		R186	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R101	1-216-087-00	METAL CHIP	39K	5%	1/10W		R187	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R102	1-216-055-00	METAL CHIP	1.8K	5%	1/10W		R188	1-216-096-00	METAL CHIP	91K	5%	1/10W	
R103	1-216-087-00	METAL CHIP	39K	5%	1/10W		R501	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R104	1-216-089-00	METAL CHIP	47K	5%	1/10W		R502	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R105	1-216-060-00	METAL CHIP	3K	5%	1/10W		R503	1-216-038-00	METAL CHIP	360	5%	1/10W	
R106	1-216-073-00	METAL CHIP	10K	5%	1/10W		R504	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R107	1-216-097-00	METAL CHIP	100K	5%	1/10W		R505	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R108	1-216-063-00	METAL CHIP	3.9K	5%	1/10W		R506	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R109	1-216-061-00	METAL CHIP	3.3K	5%	1/10W		R507	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R110	1-216-073-00	METAL CHIP	10K	5%	1/10W		R508	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R111	1-216-075-00	METAL CHIP	12K	5%	1/10W		R509	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R112	1-216-049-00	METAL CHIP	1K	5%	1/10W		R510	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R113	1-216-025-00	METAL CHIP	100	5%	1/10W		R511	1-216-094-00	METAL CHIP	75K	5%	1/10W	
R114	1-216-060-00	METAL CHIP	3K	5%	1/10W		R512	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R115	1-216-073-00	METAL CHIP	10K	5%	1/10W		R513	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R116	1-216-035-00	METAL CHIP	270	5%	1/10W		R514	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R117	1-216-035-00	METAL CHIP	270	5%	1/10W		R515	1-216-295-00	METAL CHIP	0	5%	1/10W	
R118	1-216-049-00	METAL CHIP	1K	5%	1/10W		R516	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R152	1-216-058-00	METAL CHIP	2.4K	5%	1/10W		R517	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R153	1-216-056-00	METAL CHIP	2K	5%	1/10W		R518	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R154	1-216-055-00	METAL CHIP	1.8K	5%	1/10W		R519	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R155	1-216-052-00	METAL CHIP	1.3K	5%	1/10W		R520	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R156	1-216-036-00	METAL CHIP	300	5%	1/10W		R521	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R157	1-216-051-00	METAL CHIP	1.2K	5%	1/10W		R522	1-216-070-00	METAL CHIP	7.5K	5%	1/10W	
R158	1-216-034-00	METAL CHIP	240	5%	1/10W		R523	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R159	1-216-032-00	METAL CHIP	200	5%	1/10W		R524	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R160	1-216-059-00	METAL CHIP	2.7K	5%	1/10W		R525	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R161	1-216-073-00	METAL CHIP	10K	5%	1/10W		R526	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R162	1-216-067-00	METAL CHIP	5.6K	5%	1/10W		R527	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R163	1-216-054-00	METAL CHIP	1.6K	5%	1/10W		R528	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R164	1-216-055-00	METAL CHIP	1.8K	5%	1/10W		R529	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R165	1-216-043-00	METAL CHIP	560	5%	1/10W		R530	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R166	1-216-050-00	METAL CHIP	1.1K	5%	1/10W		R531	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R167	1-216-031-00	METAL CHIP	180	5%	1/10W		R532	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R168	1-216-027-00	METAL CHIP	120	5%	1/10W		R533	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R169	1-216-052-00	METAL CHIP	1.3K	5%	1/10W		R534	1-216-066-00	METAL CHIP	5.1K	5%	1/10W	
R170	1-216-070-00	METAL CHIP	7.5K	5%	1/10W		R535	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R171	1-216-042-00	METAL CHIP	510	5%	1/10W		R536	1-216-041-00	METAL CHIP	470	5%	1/10W	
R172	1-216-081-00	METAL CHIP	22K	5%	1/10W		R543	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R173	1-216-081-00	METAL CHIP	22K	5%	1/10W		R546	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R174	1-216-047-00	METAL CHIP	820	5%	1/10W		R547	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R175	1-216-042-00	METAL CHIP	510	5%	1/10W		R548	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R176	1-216-041-00	METAL CHIP	470	5%	1/10W		R549	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R177	1-216-080-00	METAL CHIP	20K	5%	1/10W		R550	1-216-041-00	METAL CHIP	470	5%	1/10W	
R178	1-216-065-00	METAL CHIP	4.7K	5%	1/10W		R551	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R179	1-216-044-00	METAL CHIP	620	5%	1/10W		R552	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	

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Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
R553	1-216-031-00	METAL CHIP	180 5% 1/10W	R617	1-216-075-00	METAL CHIP	12K 5% 1/10W
R554	1-216-048-00	METAL CHIP	910 5% 1/10W	R619	1-216-081-00	METAL CHIP	22K 5% 1/10W
R555	1-216-048-00	METAL CHIP	910 5% 1/10W	R620	1-216-308-00	METAL CHIP	4.7 5% 1/10W
R556	1-216-024-00	METAL CHIP	91 5% 1/10W	R621	1-216-051-00	METAL CHIP	1.2K 5% 1/10W
R557	1-216-024-00	METAL CHIP	91 5% 1/10W	R622	1-216-049-00	METAL CHIP	1K 5% 1/10W
R558	1-216-053-00	METAL CHIP	1.5K 5% 1/10W	R623	1-216-089-00	METAL CHIP	47K 5% 1/10W
R560	1-216-065-00	METAL CHIP	4.7K 5% 1/10W	R624	1-216-065-00	METAL CHIP	4.7K 5% 1/10W
R561	1-216-046-00	METAL CHIP	750 5% 1/10W	R625	1-216-055-00	METAL CHIP	1.8K 5% 1/10W
R562	1-216-034-00	METAL CHIP	240 5% 1/10W	R626	1-216-055-00	METAL CHIP	1.8K 5% 1/10W
R563	1-216-034-00	METAL CHIP	240 5% 1/10W	R627	1-216-049-00	METAL CHIP	1K 5% 1/10W
R564	1-216-055-00	METAL CHIP	1.8K 5% 1/10W	R628	1-216-103-00	METAL CHIP	180K 5% 1/10W
R565	1-216-057-00	METAL CHIP	2.2K 5% 1/10W	R630	1-216-067-00	METAL CHIP	5.6K 5% 1/10W
R566	1-216-055-00	METAL CHIP	1.8K 5% 1/10W	R631	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R567	1-216-049-00	METAL CHIP	1K 5% 1/10W	R632	1-216-085-00	METAL CHIP	33K 5% 1/10W
R568	1-216-073-00	METAL CHIP	10K 5% 1/10W	R633	1-216-073-00	METAL CHIP	10K 5% 1/10W
R569	1-216-049-00	METAL CHIP	1K 5% 1/10W	R634	1-216-081-00	METAL CHIP	22K 5% 1/10W
R570	1-216-081-00	METAL CHIP	22K 5% 1/10W	R635	1-216-085-00	METAL CHIP	33K 5% 1/10W
R571	1-216-053-00	METAL CHIP	1.5K 5% 1/10W	R636	1-216-055-00	METAL CHIP	1.8K 5% 1/10W
R572	1-216-062-00	METAL CHIP	3.6K 5% 1/10W	R637	1-216-049-00	METAL CHIP	1K 5% 1/10W
R573	1-216-049-00	METAL CHIP	1K 5% 1/10W	R638	1-216-049-00	METAL CHIP	1K 5% 1/10W
R574	1-216-073-00	METAL CHIP	10K 5% 1/10W	R639	1-216-039-00	METAL CHIP	390 5% 1/10W
R575	1-216-015-00	METAL CHIP	39 5% 1/10W	R640	1-216-060-00	METAL CHIP	3K 5% 1/10W
R576	1-216-015-00	METAL CHIP	39 5% 1/10W	R641	1-216-079-00	METAL CHIP	18K 5% 1/10W
R577	1-216-067-00	METAL CHIP	5.6K 5% 1/10W	R642	1-216-089-00	METAL CHIP	47K 5% 1/10W
R582	1-216-073-00	METAL CHIP	10K 5% 1/10W	R643	1-216-078-00	METAL CHIP	16K 5% 1/10W
R583	1-216-033-00	METAL CHIP	220 5% 1/10W	R644	1-216-088-00	METAL CHIP	43K 5% 1/10W
R584	1-216-033-00	METAL CHIP	220 5% 1/10W	R645	1-216-030-00	METAL CHIP	160 5% 1/10W
R585	1-216-067-00	METAL CHIP	5.6K 5% 1/10W	R646	1-216-030-00	METAL CHIP	160 5% 1/10W
R588	1-216-121-00	METAL CHIP	1M 5% 1/10W	R647	1-216-065-00	METAL CHIP	4.7K 5% 1/10W
R591	1-216-065-00	METAL CHIP	4.7K 5% 1/10W	R648	1-216-089-00	METAL CHIP	47K 5% 1/10W
R592	1-216-057-00	METAL CHIP	2.2K 5% 1/10W	R649	1-216-049-00	METAL CHIP	1K 5% 1/10W
R593	1-216-073-00	METAL CHIP	10K 5% 1/10W	R650	1-216-049-00	METAL CHIP	1K 5% 1/10W
R594	1-216-073-00	METAL CHIP	10K 5% 1/10W	R652	1-216-051-00	METAL CHIP	1.2K 5% 1/10W
R595	1-216-073-00	METAL CHIP	10K 5% 1/10W	R663	1-216-070-00	METAL CHIP	7.5K 5% 1/10W
R596	1-216-076-00	METAL CHIP	13K 5% 1/10W	R664	1-216-050-00	METAL CHIP	1.1K 5% 1/10W
R597	1-216-056-00	METAL CHIP	2K 5% 1/10W	R666	1-216-055-00	METAL CHIP	1.8K 5% 1/10W
R598	1-216-079-00	METAL CHIP	18K 5% 1/10W	R667	1-532-685-00	LINK, IC (ICP-N20)	5% 1/10W
R599	1-216-073-00	METAL CHIP	10K 5% 1/10W	R670	1-216-068-00	METAL CHIP	6.2K 5% 1/10W
R600	1-216-088-00	METAL CHIP	43K 5% 1/10W	R671	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
R601	1-216-081-00	METAL CHIP	22K 5% 1/10W	R672	1-216-053-00	METAL CHIP	1.5K 5% 1/10W
R602	1-216-073-00	METAL CHIP	10K 5% 1/10W	R673	1-216-073-00	METAL CHIP	10K 5% 1/10W
R603	1-216-083-00	METAL CHIP	27K 5% 1/10W	R677	1-216-085-00	METAL CHIP	33K 5% 1/10W
R604	1-216-083-00	METAL CHIP	27K 5% 1/10W	R678	1-216-042-00	METAL CHIP	510 5% 1/10W
R605	1-216-114-00	METAL CHIP	510K 5% 1/10W	R679	1-216-042-00	METAL CHIP	510 5% 1/10W
R606	1-216-114-00	METAL CHIP	510K 5% 1/10W	R680	1-216-042-00	METAL CHIP	510 5% 1/10W
R607	1-216-111-00	METAL CHIP	390K 5% 1/10W	R701	1-216-071-00	METAL CHIP	8.2K 5% 1/10W
R608	1-216-077-00	METAL CHIP	15K 5% 1/10W	R702	1-216-051-00	METAL CHIP	1.2K 5% 1/10W
R609	1-216-083-00	METAL CHIP	27K 5% 1/10W	R703	1-216-051-00	METAL CHIP	1.2K 5% 1/10W
R610	1-216-073-00	METAL CHIP	10K 5% 1/10W	R704	1-216-085-00	METAL CHIP	33K 5% 1/10W
R611	1-216-065-00	METAL CHIP	4.7K 5% 1/10W	R705	1-215-465-00	METAL	68K 1% 1/6W
R612	1-216-057-00	METAL CHIP	2.2K 5% 1/10W	R706	1-215-425-00	METAL	1.5K 1% 1/6W
R613	1-216-056-00	METAL CHIP	2K 5% 1/10W	R707	1-215-658-00	METAL	1.5 1% 1/4W
R614	1-216-009-00	METAL CHIP	22 5% 1/10W	R708	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
R615	1-216-114-00	METAL CHIP	510K 5% 1/10W	R709	1-216-041-00	METAL CHIP	470 5% 1/10W
R616	1-216-073-00	METAL CHIP	10K 5% 1/10W	R710	1-215-451-00	METAL	18K 1% 1/6W

NOTE:

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When indicating parts by reference number, please include the board name.

Ref.No.	Part No.	Description	Remark			Ref.No.	Part No.	Description	Remark		
R711	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	R767	1-214-966-00	METAL	1.2M	1%	1/4W
R712	1-216-105-00	METAL CHIP	220K	5%	1/10W	R831	1-216-073-00	METAL CHIP	10K	5%	1/10W
R713	1-216-082-00	METAL CHIP	24K	5%	1/10W	R851	1-216-121-00	METAL CHIP	1M	5%	1/10W
R714	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	R852	1-216-049-00	METAL CHIP	1K	5%	1/10W
R715	1-216-066-00	METAL CHIP	5.1K	5%	1/10W	R855	1-216-049-00	METAL CHIP	1K	5%	1/10W
R716	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	R856	1-216-049-00	METAL CHIP	1K	5%	1/10W
R717	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	R857	1-216-049-00	METAL CHIP	1K	5%	1/10W
R719	1-216-073-00	METAL CHIP	10K	5%	1/10W	R859	1-216-049-00	METAL CHIP	1K	5%	1/10W
R720	1-216-113-00	METAL CHIP	470K	5%	1/10W	R865	1-216-049-00	METAL CHIP	1K	5%	1/10W
R721	1-216-077-00	METAL CHIP	15K	5%	1/10W	R866	1-216-041-00	METAL CHIP	470	5%	1/10W
R722	1-216-101-00	METAL CHIP	150K	5%	1/10W	R867	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R723	1-216-073-00	METAL CHIP	10K	5%	1/10W	R871	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R724	1-216-095-00	METAL CHIP	82K	5%	1/10W	R872	1-216-043-00	METAL CHIP	560	5%	1/10W
R725	1-216-109-00	METAL CHIP	330K	5%	1/10W	R873	1-216-049-00	METAL CHIP	1K	5%	1/10W
R726	1-216-081-00	METAL CHIP	22K	5%	1/10W	R874	1-215-430-00	METAL	2.4K	1%	1/6W
R727	1-216-081-00	METAL CHIP	22K	5%	1/10W	R875	1-215-439-00	METAL	5.6K	1%	1/6W
R728	1-216-085-00	METAL CHIP	33K	5%	1/10W	R876	1-532-637-00	LINK, IC (ICP-N25)			
R729	1-215-446-00	METAL	11K	1%	1/6W	VARIABLE RESISTOR					
R730	1-214-996-00	METAL	0.47	1%	1/4W	RV007	1-226-702-00	RES, ADJ, METAL GLAZE	2.2K		
R731	1-216-121-00	METAL CHIP	1M	5%	1/10W	RV008	1-226-771-00	RES, ADJ, METAL GLAZE	1K		
R732	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	RV151	1-226-776-00	RES, ADJ, METAL GLAZE	220K		
R733	1-214-970-00	METAL	1.8M	1%	1/4W	RV152	1-226-773-00	RES, ADJ, METAL GLAZE	22K		
R734	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	RV153	1-226-773-00	RES, ADJ, METAL GLAZE	22K		
R735	1-214-961-00	METAL	750K	1%	1/4W	RV154	1-226-774-00	RES, ADJ, METAL GLAZE	47K		
R736	1-215-474-00	METAL	160K	1%	1/6W	RV155	1-226-774-00	RES, ADJ, METAL GLAZE	47K		
R737	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	RV156	1-226-770-00	RES, ADJ, METAL GLAZE	470		
R738	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	RV501	1-226-753-00	RES, ADJ, SOLID	47K		
R739	1-216-037-00	METAL CHIP	330	5%	1/10W	RV502	1-226-710-00	RES, ADJ, SOLID	10K		
R740	1-216-049-00	METAL CHIP	1K	5%	1/10W	RV503	1-226-711-00	RES, ADJ, SOLID	22K		
R741	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	RV504	1-226-709-00	RES, ADJ, SOLID	4.7K		
R742	1-216-049-00	METAL CHIP	1K	5%	1/10W	RV505	1-226-710-00	RES, ADJ, SOLID	10K		
R743	1-216-049-00	METAL CHIP	1K	5%	1/10W	RV506	1-226-710-00	RES, ADJ, SOLID	10K		
R744	1-214-963-00	METAL	910K	1%	1/4W	RV507	1-226-709-00	RES, ADJ, SOLID	4.7K		
R745	1-215-461-00	METAL	47K	1%	1/6W	RV508	1-226-706-00	RES, ADJ, SOLID	470		
R746	1-216-049-00	METAL CHIP	1K	5%	1/10W	RV509	1-226-707-00	RES, ADJ, SOLID	1K		
R747	1-216-049-00	METAL CHIP	1K	5%	1/10W	RV510	1-226-709-00	RES, ADJ, SOLID	4.7K		
R748	1-216-037-00	METAL CHIP	330	5%	1/10W	RV511	1-226-753-00	RES, ADJ, SOLID	47K		
R749	1-216-049-00	METAL CHIP	1K	5%	1/10W	RV512	1-226-753-00	RES, ADJ, SOLID	47K		
R750	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	RV513	1-226-710-00	RES, ADJ, SOLID	10K		
R752	1-216-049-00	METAL CHIP	1K	5%	1/10W	RV514	1-226-710-00	RES, ADJ, SOLID	10K		
R753	1-216-073-00	METAL CHIP	10K	5%	1/10W	RV515	1-226-711-00	RES, ADJ, SOLID	22K		
R754	1-216-105-00	METAL CHIP	220K	5%	1/10W	RV516	1-226-702-00	RES, ADJ, METAL GLAZE	2.2K		
R755	1-216-119-00	METAL CHIP	820K	5%	1/10W	RV517	1-226-702-00	RES, ADJ, METAL GLAZE	2.2K		
R756	1-216-083-00	METAL CHIP	27K	5%	1/10W	RV518	1-226-702-00	RES, ADJ, METAL GLAZE	2.2K		
R757	1-216-049-00	METAL CHIP	1K	5%	1/10W	RV519	1-226-702-00	RES, ADJ, METAL GLAZE	2.2K		
R758	1-216-085-00	METAL CHIP	33K	5%	1/10W	RV521	1-226-709-00	RES, ADJ, SOLID	4.7K		
R759	1-215-469-00	METAL	100K	1%	1/6W	RV522	1-226-709-00	RES, ADJ, SOLID	4.7K		
R760	1-214-953-00	METAL	360K	1%	1/4W	RV523	1-226-709-00	RES, ADJ, SOLID	4.7K		
R762	1-215-453-00	METAL	22K	1%	1/6W	RV524	1-226-711-00	RES, ADJ, SOLID	22K		
R763	1-215-414-00	METAL	510	1%	1/6W	RV525	1-226-711-00	RES, ADJ, SOLID	22K		
R764	1-216-081-00	METAL CHIP	22K	5%	1/10W	RV526	1-226-708-00	RES, ADJ, SOLID	2.2K		
R765	1-216-113-00	METAL CHIP	470K	5%	1/10W	RV701	1-226-770-00	RES, ADJ, METAL GLAZE	470		
R766	1-216-095-00	METAL CHIP	82K	5%	1/10W						

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VC-2**GC-3****GC-4****GC-5**

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
RV702	1-226-715-00	RES, ADJ, SOLID 470K		R659	1-216-113-00	METAL CHIP 470K 5%	1/10W
RV703	1-226-769-00	RES, ADJ, METAL GLAZE 100		R660	1-216-044-00	METAL CHIP 620 5%	1/10W
RV704	1-226-753-00	RES, ADJ, SOLID 47K		R661	1-216-073-00	METAL CHIP 10K 5%	1/10W
RV705	1-226-701-00	RES, ADJ, METAL GLAZE 220		R662	1-216-121-00	METAL CHIP 1M 5%	1/10W
RV706	1-226-777-00	RES, ADJ, METAL GLAZE 1M		R665	1-216-044-00	METAL CHIP 620 5%	1/10W
RV707	1-226-704-00	RES, ADJ, METAL GLAZE 470K		R668	1-216-047-00	METAL CHIP 820 5%	1/10W
RV708	1-226-703-00	RES, ADJ, METAL GLAZE 10K		R669	1-216-047-00	METAL CHIP 820 5%	1/10W
RV709	1-226-776-00	RES, ADJ, METAL GLAZE 220K		R853	1-216-050-00	METAL CHIP 1.1K 5%	1/10W
RV710	1-226-704-00	RES, ADJ, METAL GLAZE 470K		R854	1-216-050-00	METAL CHIP 1.1K 5%	1/10W
RV711	1-226-703-00	RES, ADJ, METAL GLAZE 10K		R860	1-216-035-00	METAL CHIP 270 5%	1/10W
RV712	1-226-704-00	RES, ADJ, METAL GLAZE 470K		R861	1-216-035-00	METAL CHIP 270 5%	1/10W
RV851	1-226-771-00	RES, ADJ, METAL GLAZE 1K					
<u>SR BLOCK</u>				<u>CRYSTAL</u>			
SR701A	1-464-276-00	SR BLOCK		X652	1-567-157-00	VIBRATOR, CRYSTAL	
<u>TRANSFORMER</u>				*****			
T701	1-433-260-00	TRANSFORMER, COUPLING (H)		♣:1-611-417-00	GC-4 BOARD		
T702	1-433-261-00	TRANSFORMER, COUPLING (V)			*****		
<u>CRYSTAL</u>				<u>CAPACITOR</u>			
X651	1-567-158-00	VIBRATOR, CRYSTAL		C546	1-124-233-00	ELECT 10MF 20%	16V
*****				C547	1-124-233-00	ELECT 10MF 20%	16V
♣:A-7513-005-A	GC-3 BOARD, COMPLETE			C550	1-163-080-00	CERAMIC CHIP 0.047MF	10% 25V
	*****			C551	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V
<u>CAPACITOR</u>				C555	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V
C657	1-163-019-00	CERAMIC CHIP 0.0068MF	10% 50V	<u>IC</u>			
C658	1-163-222-00	CERAMIC CHIP 5PF	0.25PF 50V	IC508	8-759-906-59	IC CX22017	
C659	1-163-235-00	CERAMIC CHIP 22PF	5% 50V	<u>TRANSISTOR</u>			
C665	1-124-254-00	ELECT 0.68MF	20% 50V	Q513	8-729-100-66	TRANSISTOR 2SC1623	
C851	1-131-387-00	TANTALUM 47MF	10% 6.3V	Q514	8-729-100-66	TRANSISTOR 2SC1623	
C855	1-163-259-00	CERAMIC CHIP 220PF	5% 50V	<u>RESISTOR</u>			
C856	1-163-259-00	CERAMIC CHIP 220PF	5% 50V	R578	1-216-073-00	METAL CHIP 10K 5%	1/10W
<u>TRIMMER</u>				R579	1-216-073-00	METAL CHIP 10K 5%	1/10W
CT651	1-141-246-00	CAP, TRMIIER		R580	1-216-073-00	METAL CHIP 10K 5%	1/10W
<u>DIODE</u>				R581	1-216-073-00	METAL CHIP 10K 5%	1/10W
D651	8-712-500-00	DIODE 1T25		R586	1-216-089-00	METAL CHIP 47K 5%	1/10W
D852	8-719-105-90	DIODE RD5.6M-B1		R589	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
<u>IC</u>				R618	1-216-067-00	METAL CHIP 5.6K 5%	1/10W
IC651	8-759-193-58	IC UPC358G		*****			
<u>COIL</u>				♣:1-611-418-00	GC-5 BOARD		
L851	1-408-429-00	MICRO INDUCTOR 470UH			*****		
L852	1-408-613-00	MICRO INDUCTOR 68UH		<u>CAPACITOR</u>			
L853	1-408-613-00	MICRO INDUCTOR 68UH		C517	1-124-233-00	ELECT 10MF 20%	16V
<u>RESISTOR</u>				C519	1-123-822-00	ELECT 47MF 20%	10V
R657	1-216-067-00	METAL CHIP 5.6K 5%	1/10W	C520	1-124-231-00	ELECT 4.7MF 20%	16V
R658	1-216-073-00	METAL CHIP 10K 5%	1/10W	C522	1-163-106-00	CERAMIC CHIP 36PF	5% 50V
				C581	1-163-081-00	CERAMIC CHIP 0.22MF	25V
				C664	1-124-233-00	ELECT 10MF 20%	16V

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GC-5

FL-1

AU-3

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
<u>IC</u>				<u>IC</u>			
IC503	8-759-906-47	IC CX20065		C411	1-124-249-00	ELECT 0.1MF 20% 50V	
IC504	8-759-905-85	IC CX10018		C412	1-130-489-00	MYLAR 0.033MF 5% 50V	
<u>TRANSISTOR</u>				C413	1-163-011-00	CERAMIC CHIP 0.0015MF 10% 50V	
Q508	8-729-100-76	TRANSISTOR 2SA812		C414	1-124-255-00	ELECT 1MF 20% 50V	
Q651	8-729-100-66	TRANSISTOR 2SC1623		C415	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
<u>RESISTOR</u>				C416	1-124-140-00	ELECT 220MF 20% 10V	
R537	1-216-051-00	METAL CHIP 1.2K 5% 1/10W		C417	1-124-169-00	ELECT 100MF 20% 10V	
R538	1-216-045-00	METAL CHIP 680 5% 1/10W		C418	1-124-238-11	ELECT 4.7MF 20% 25V	
R539	1-216-049-00	METAL CHIP 1K 5% 1/10W		C419	1-124-222-00	ELECT 22MF 20% 6.3V	
R540	1-216-065-00	METAL CHIP 4.7K 5% 1/10W		C420	1-123-647-00	ELECT 47MF 20% 6.3V	
R541	1-216-093-00	METAL CHIP 68K 5% 1/10W		C421	1-124-253-00	ELECT 0.47MF 20% 50V	
R542	1-216-069-00	METAL CHIP 6.8K 5% 1/10W		C430	1-163-011-00	CERAMIC CHIP 0.0015MF 10% 50V	
R544	1-215-659-00	METAL 5.1K 5% 1/8W		C432	1-163-078-00	CERAMIC CHIP 0.033MF 10% 25V	
R545	1-216-097-00	METAL CHIP 100K 5% 1/10W		C433	1-163-078-00	CERAMIC CHIP 0.033MF 10% 25V	
R674	1-216-079-00	METAL CHIP 18K 5% 1/10W		<u>CONNECTOR</u>			
R675	1-216-059-00	METAL CHIP 2.7K 5% 1/10W		CN401	1-564-004-00	PIN, CONNECTOR 5P	
R676	1-216-049-00	METAL CHIP 1K 5% 1/10W		CN402	1-564-005-00	PIN, CONNECTOR 6P	
*****				CN403	1-564-004-00	PIN, CONNECTOR 5P	
♣:1-610-553-00 FL-1 BOARD				CN407	1-564-001-11	PIN, CONNECTOR 2P	
*****				<u>DIODE</u>			
<u>CAPACITOR</u>				D401	8-719-911-19	DIODE 1SS119	
C571	1-163-080-00	CERAMIC CHIP 0.047MF 10% 25V		<u>IC</u>			
<u>CONNECTOR</u>				IC401	8-759-800-43	IC LA7043M	
CN507	1-556-642-00	CONNECTOR ASSY (2.0MM) 3P		<u>COIL</u>			
<u>SWITCH</u>				L401	1-421-600-00	COIL, CHOKE (6.8MMH)	
S501	1-554-377-21	SWITCH, SLIDE		<u>TRANSISTOR</u>			
*****				Q401	8-729-100-66	TRANSISTOR 2SC1623	
♣:1-609-864-00 AU-3 BOARD				Q406	8-729-100-66	TRANSISTOR 2SC1623	
*****				Q407	8-729-100-66	TRANSISTOR 2SC1623	
<u>CAPACITOR</u>				<u>RESISTOR</u>			
C401	1-124-225-00	ELECT 100MF 20% 6.3V		R401	1-216-067-00	METAL CHIP 5.6K 5% 1/10W	
C402	1-163-009-00	CERAMIC CHIP 0.001MF 10% 50V		R402	1-216-071-00	METAL CHIP 8.2K 5% 1/10W	
C403	1-124-238-11	ELECT 4.7MF 20% 25V		R403	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
C404	1-124-257-00	ELECT 2.2MF 20% 50V		R404	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
C405	1-124-253-00	ELECT 0.47MF 20% 50V		R405	1-216-073-00	METAL CHIP 10K 5% 1/10W	
C406	1-124-238-11	ELECT 4.7MF 20% 25V		R406	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
C407	1-163-011-00	CERAMIC CHIP 0.0015MF 10% 50V		R407	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
C408	1-123-647-00	ELECT 47MF 20% 6.3V		R408	1-216-022-00	METAL CHIP 75 5% 1/10W	
C409	1-124-253-00	ELECT 0.47MF 20% 50V		R409	1-216-025-00	METAL CHIP 100 5% 1/10W	
C410	1-124-238-11	ELECT 4.7MF 20% 25V		R411	1-216-083-00	METAL CHIP 27K 5% 1/10W	
				R412	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
				R413	1-216-081-00	METAL CHIP 22K 5% 1/10W	
				R414	1-216-111-00	METAL CHIP 390K 5% 1/10W	
				R415	1-216-085-00	METAL CHIP 33K 5% 1/10W	
				R418	1-216-071-00	METAL CHIP 8.2K 5% 1/10W	
				R424	1-216-097-00	METAL CHIP 100K 5% 1/10W	

When indicating parts by reference number, please include the board name.

AU-3**AU-4****SS-17**

Ref.No.	Part No.	Description	Remark
R425	1-216-094-00	METAL CHIP 75K 5% 1/10W	
R426	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R427	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R428	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R429	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R437	1-216-097-00	METAL CHIP 100K 5% 1/10W	
<u>VARIABLE RESISTOR</u>			
RV401	1-226-703-00	RES, ADJ, METAL GLAZE 10K	
<u>SWITCH</u>			
S401	1-554-364-00	SWITCH, SLIDE	

♣:1-609-865-00	AU-4 BOARD	*****	
<u>CAPACITOR</u>			
C422	1-107-177-00	MICA 220PF 5% 500V	
C423	1-130-486-51	MYLAR 0.018MF 5% 50V	
C424	1-130-485-00	MYLAR 0.015MF 5% 50V	
C425	1-130-485-00	MYLAR 0.015MF 5% 50V	
C426	1-124-233-00	ELECT 10MF 20% 16V	
C427	1-107-177-00	MICA 220PF 5% 500V	
C428	1-130-303-00	FILM 0.018MF 5% 100V	
C429	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C431	1-163-009-00	CERAMIC CHIP 0.001MF 10% 50V	
C435	1-123-647-00	ELECT 47MF 20% 6.3V	
<u>CONNECTOR</u>			
CN404♣:1-564-001-11	PIN, CONNECTOR 2P		
CN405♣:1-564-001-11	PIN, CONNECTOR 2P		
<u>COIL</u>			
L402	1-421-601-00	COIL, CHOKE (27MMH)	
L403	1-408-429-00	MICRO INDUCTOR 470UH	
<u>TRANSISTOR</u>			
Q402	8-729-100-66	TRANSISTOR 2SC1623	
Q403	8-729-100-66	TRANSISTOR 2SC1623	
Q404	8-729-100-66	TRANSISTOR 2SC1623	
Q405	8-729-100-66	TRANSISTOR 2SC1623	
Q408	8-729-100-66	TRANSISTOR 2SC1623	
Q409	8-729-100-76	TRANSISTOR 2SA812	
Q410	8-729-103-52	TRANSISTOR 2SC1654	
Q411	8-729-103-52	TRANSISTOR 2SC1654	
<u>RESISTOR</u>			
R416	1-216-071-00	METAL CHIP 8.2K 5% 1/10W	
R417	1-216-001-00	METAL CHIP 10 5% 1/10W	
R419	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R420	1-216-089-00	METAL CHIP 47K 5% 1/10W	

Ref.No.	Part No.	Description	Remark
R421	1-216-083-00	METAL CHIP 27K 5% 1/10W	
R422	1-216-083-00	METAL CHIP 27K 5% 1/10W	
R423	1-216-001-00	METAL CHIP 10 5% 1/10W	
R430	1-216-088-00	METAL CHIP 43K 5% 1/10W	
R431	1-216-099-00	METAL CHIP 120K 5% 1/10W	
R432	1-216-075-00	METAL CHIP 12K 5% 1/10W	
R433	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R434	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R435	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R436	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
<u>VARIABLE RESISTOR</u>			
RV403	1-226-776-00	RES, ADJ, METAL GLAZE 220K	
<u>TRANSFORMER</u>			
T401	1-433-271-00	TRANSFORMER, BIAS OSCILLATOR	

♣:A-6717-339-A	SS-17 BOARD, COMPLETE	*****	
♣:3-662-075-00	COVER, CONTROL		
<u>CAPACITOR</u>			
C201	1-163-080-00	CERAMIC CHIP 0.047MF 10% 25V	
C202	1-124-227-11	ELECT 10MF 20% 10V	
C203	1-130-491-00	MYLAR 0.047MF 5% 50V	
C204	1-163-009-00	CERAMIC CHIP 0.001MF 10% 50V	
C205	1-131-344-00	TANTALUM 0.33MF 20% 35V	
C206	1-163-078-00	CERAMIC CHIP 0.033MF 10% 25V	
C207	1-124-233-00	ELECT 10MF 20% 16V	
C208	1-124-233-00	ELECT 10MF 20% 16V	
C209	1-163-080-00	CERAMIC CHIP 0.047MF 10% 25V	
C210	1-130-494-51	MYLAR 0.082MF 5% 50V	
C211	1-163-009-00	CERAMIC CHIP 0.001MF 10% 50V	
C212	1-130-489-00	MYLAR 0.033MF 5% 50V	
C213	1-124-253-00	ELECT 0.47MF 20% 50V	
C214	1-163-080-00	CERAMIC CHIP 0.047MF 10% 25V	
C215	1-130-479-00	MYLAR 0.0047MF 5% 50V	
C216	1-161-772-11	CERAMIC 0.1MF 10% 25V	
C217	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C218	1-124-169-00	ELECT 100MF 20% 10V	
C219	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C220	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C221	1-124-231-00	ELECT 4.7MF 16V	
C222	1-124-243-11	ELECT 2.2MF 20% 35V	
C223	1-124-227-11	ELECT 10MF 20% 10V	
C224	1-124-243-11	ELECT 2.2MF 20% 35V	
C225	1-163-080-00	CERAMIC CHIP 0.047MF 10% 25V	
C228	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C229	1-124-234-00	ELECT 22MF 20% 16V	
C301	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C302	1-130-476-00	MYLAR 0.0027MF 5% 50V	

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Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
C303	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V	<u>DIODE</u>			
C304	1-124-255-00	ELECT 1MF	20% 50V	D202	8-719-200-27	DIODE E10DS2	
C305	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V	D301	8-719-911-19	DIODE 1SS119	
C306	1-124-255-00	ELECT 1MF	20% 50V	D302 =>	8-719-910-68	DIODE HZ602L	
C307	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V	D303	8-719-200-27	DIODE E10DS2	
C308	1-130-476-00	MYLAR 0.0027MF	5% 50V	D304	8-719-200-27	DIODE E10DS2	
C309	1-163-038-00	CERAMIC CHIP 0.1MF	25V	D305	8-719-200-27	DIODE E10DS2	
C311	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V	D306	8-719-200-27	DIODE E10DS2	
C312	1-163-038-00	CERAMIC CHIP 0.1MF	25V	D307	8-719-100-03	DIODE 1S2835	
C313	1-124-255-00	ELECT 1MF	20% 50V	D308	8-719-200-27	DIODE E10DS2	
C314	1-124-255-00	ELECT 1MF	20% 50V	D309	8-719-200-27	DIODE E10DS2	
C315	1-124-168-00	ELECT 100MF	20% 16V	D310	8-719-200-27	DIODE E10DS2	
C317	1-163-081-00	CERAMIC CHIP 0.22MF	25V	D311	8-719-200-27	DIODE E10DS2	
C318	1-163-104-00	CERAMIC CHIP 30PF	5% 50V	D312	8-719-200-27	DIODE E10DS2	
C319	1-163-104-00	CERAMIC CHIP 30PF	5% 50V	D313	8-719-100-03	DIODE 1S2835	
C320	1-163-037-00	CERAMIC CHIP 0.022MF	10% 25V	D314	8-719-100-03	DIODE 1S2835	
C321	1-163-037-00	CERAMIC CHIP 0.022MF	10% 25V	D315	8-719-100-66	DIODE RD12E-B3	
C326	1-131-408-00	TANTALUM 1MF	20% 25V	D316	8-719-100-05	DIODE 1S2837	
C327	1-131-408-00	TANTALUM 1MF	20% 25V	<u>CONVERTER</u>			
C328	1-131-408-00	TANTALUM 1MF	20% 25V	DR301	1-464-269-00	CONVERTER, DC-DC	
C329	1-131-408-00	TANTALUM 1MF	20% 25V	<u>IC</u>			
C330	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V	IC201	8-759-601-86	IC CX186	
C331	1-163-037-00	CERAMIC CHIP 0.022MF	10% 25V	IC202	8-759-100-94	IC UPC358G2	
C332	1-163-017-00	CERAMIC CHIP 0.0047MF	10% 50V	IC301	8-759-909-65	IC MB88501-167N	
C333	1-163-021-00	CERAMIC CHIP 0.01MF	10% 50V	IC302	8-759-100-93	IC UPC393G2	
C335	1-163-075-00	CERAMIC CHIP 0.047MF	50V	<u>COIL</u>			
C336	1-163-077-00	CERAMIC CHIP 0.1MF	50V	L201	1-408-450-11	MICRO INDUCTOR 47UH	
C337	1-124-233-00	ELECT 10MF	20% 16V	L203	1-407-847-00	MICRO INDUCTOR 35UH	
C338	1-131-380-00	TANTALUM 33MF	10% 10V	L301	1-408-462-11	MICRO INDUCTOR 470UH	
C340	1-131-368-00	TANTALUM 3.3MF	10% 16V	L302	1-408-450-11	MICRO INDUCTOR 47UH	
<u>CONNECTOR</u>				<u>TRANSISTOR</u>			
CN201	1-564-012-00	PIN, CONNECTOR 2P		Q201	8-729-100-66	TRANSISTOR 2SC1623	
CN202	1-564-001-11	PIN, CONNECTOR 2P		Q202	8-729-100-76	TRANSISTOR 2SA812	
CN203	1-564-012-00	PIN, CONNECTOR 2P		Q203	8-729-100-66	TRANSISTOR 2SC1623	
CN204	1-564-001-11	PIN, CONNECTOR 2P		Q204	8-729-100-66	TRANSISTOR 2SC1623	
CN205	1-564-001-11	PIN, CONNECTOR 2P		Q205	8-729-100-76	TRANSISTOR 2SA812	
CN206	1-564-002-00	PIN, CONNECTOR 3P		Q210	8-729-100-76	TRANSISTOR 2SA812	
CN207	1-564-013-00	PIN, CONNECTOR 3P		Q211	8-729-100-66	TRANSISTOR 2SC1623	
CN301	1-564-016-00	PIN, CONNECTOR 6P		Q212	8-729-100-66	TRANSISTOR 2SC1623	
CN302	1-564-002-00	PIN, CONNECTOR 3P		Q213	8-729-100-66	TRANSISTOR 2SC1623	
CN303	1-564-001-11	PIN, CONNECTOR 2P		Q214	8-729-100-66	TRANSISTOR 2SC1623	
CN305	1-564-001-11	PIN, CONNECTOR 2P		Q215	8-729-100-66	TRANSISTOR 2SC1623	
CN306	1-564-003-00	PIN, CONNECTOR 4P		Q217	8-729-199-92	TRANSISTOR 2SD999	
CN307	1-564-003-00	PIN, CONNECTOR 4P		Q218	8-729-199-92	TRANSISTOR 2SD999	
CN308	1-564-005-00	PIN, CONNECTOR 6P		Q219	8-729-100-76	TRANSISTOR 2SA812	
CN309	1-564-001-11	PIN, CONNECTOR 2P		Q220	8-729-100-76	TRANSISTOR 2SA812	
CN310	1-564-002-00	PIN, CONNECTOR 3P		Q301	8-729-100-66	TRANSISTOR 2SC1623	
CN311	1-564-002-00	PIN, CONNECTOR 3P		Q302	8-729-100-66	TRANSISTOR 2SC1623	
CN312	1-564-002-00	PIN, CONNECTOR 3P					
CN313	1-564-020-00	PIN, CONNECTOR 10P					
CN314	1-564-001-11	PIN, CONNECTOR 2P					
CN316	1-564-002-00	PIN, CONNECTOR 3P					

When indicating parts by reference number, please include the board name.

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Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
Q303	8-729-100-76	TRANSISTOR 2SA812		R214	1-216-069-00	METAL CHIP 6.8K 5%	1/10W
Q304	8-729-100-76	TRANSISTOR 2SA812		R215	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
Q306	8-729-100-76	TRANSISTOR 2SA812		R216	1-215-465-00	METAL 68K 1%	1/6W
Q307 =>	8-729-245-83	TRANSISTOR 2SC2458		R217	1-216-085-00	METAL CHIP 33K 5%	1/10W
Q308	8-729-100-66	TRANSISTOR 2SC1623		R218	1-215-469-00	METAL 100K 1%	1/6W
Q309	8-729-100-66	TRANSISTOR 2SC1623		R219	1-216-093-00	METAL CHIP 68K 5%	1/10W
Q310	8-729-104-36	TRANSISTOR 2SB1040		R220	1-216-089-00	METAL CHIP 47K 5%	1/10W
Q311	8-729-100-76	TRANSISTOR 2SA812		R221	1-216-089-00	METAL CHIP 47K 5%	1/10W
Q312	8-729-100-66	TRANSISTOR 2SC1623		R222	1-216-111-00	METAL CHIP 390K 5%	1/10W
Q313	8-729-102-78	TRANSISTOR 2SB962		R223	1-216-095-00	METAL CHIP 82K 5%	1/10W
Q314	8-729-100-76	TRANSISTOR 2SA812		R224	1-216-095-00	METAL CHIP 82K 5%	1/10W
Q315	8-729-100-66	TRANSISTOR 2SC1623		R225	1-216-053-00	METAL CHIP 1.5K 5%	1/10W
Q316	8-729-101-07	TRANSISTOR 2SB798		R227	1-216-097-00	METAL CHIP 100K 5%	1/10W
Q317	8-729-100-76	TRANSISTOR 2SA812		R228	1-216-097-00	METAL CHIP 100K 5%	1/10W
Q318	8-729-100-66	TRANSISTOR 2SC1623		R229	1-216-097-00	METAL CHIP 100K 5%	1/10W
Q319	8-729-101-07	TRANSISTOR 2SB798		R230	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
Q320	8-729-100-76	TRANSISTOR 2SA812		R231	1-216-077-00	METAL CHIP 15K 5%	1/10W
Q321	8-729-100-66	TRANSISTOR 2SC1623		R232	1-216-060-00	METAL CHIP 3K 5%	1/10W
Q322	8-729-102-78	TRANSISTOR 2SB962		R233	1-216-056-00	METAL CHIP 2K 5%	1/10W
Q323	8-729-100-76	TRANSISTOR 2SA812		R234	1-216-056-00	METAL CHIP 2K 5%	1/10W
Q324	8-729-100-76	TRANSISTOR 2SA812		R235	1-216-121-00	METAL CHIP 1M 5%	1/10W
Q325	8-729-100-76	TRANSISTOR 2SA812		R236	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
Q326	8-729-100-76	TRANSISTOR 2SA812		R237	1-216-077-00	METAL CHIP 15K 5%	1/10W
Q328	8-729-199-92	TRANSISTOR 2SD999		R238	1-216-073-00	METAL CHIP 10K 5%	1/10W
Q329	8-729-101-07	TRANSISTOR 2SB798		R239	1-216-099-00	METAL CHIP 120K 5%	1/10W
Q331	8-729-199-92	TRANSISTOR 2SD999		R240	1-216-069-00	METAL CHIP 6.8K 5%	1/10W
Q332	8-729-101-07	TRANSISTOR 2SB798		R241	1-216-076-00	METAL CHIP 13K 5%	1/10W
Q333	8-729-100-66	TRANSISTOR 2SC1623		R242	1-216-036-00	METAL CHIP 300 5%	1/10W
Q334	8-729-100-76	TRANSISTOR 2SA812		R243	1-216-079-00	METAL CHIP 18K 5%	1/10W
Q335	8-729-100-76	TRANSISTOR 2SA812		R244	1-216-082-00	METAL CHIP 24K 5%	1/10W
Q336	8-729-100-66	TRANSISTOR 2SC1623		R245	1-216-089-00	METAL CHIP 47K 5%	1/10W
Q338	8-729-100-66	TRANSISTOR 2SC1623		R246	1-216-089-00	METAL CHIP 47K 5%	1/10W
Q339	8-729-100-76	TRANSISTOR 2SA812		R247	1-216-097-00	METAL CHIP 100K 5%	1/10W
Q340	8-729-100-76	TRANSISTOR 2SA812		R248	1-216-089-00	METAL CHIP 47K 5%	1/10W
Q341	8-729-100-76	TRANSISTOR 2SA812		R249	1-216-097-00	METAL CHIP 100K 5%	1/10W
Q342	8-729-100-66	TRANSISTOR 2SC1623		R250	1-216-031-00	METAL CHIP 180 5%	1/10W
Q343	8-729-100-66	TRANSISTOR 2SC1623		R253	1-216-066-00	METAL CHIP 5.1K 5%	1/10W
Q344	8-729-100-66	TRANSISTOR 2SC1623		R254	1-216-066-00	METAL CHIP 5.1K 5%	1/10W
RESISTOR				R255	1-216-073-00	METAL CHIP 10K 5%	1/10W
R201	1-216-073-00	METAL CHIP 10K 5%	1/10W	R256	1-246-446-00	CARBON 75 5%	1/4W
R202	1-216-097-00	METAL CHIP 100K 5%	1/10W	R301	1-216-106-00	METAL CHIP 240K 5%	1/10W
R203	1-216-097-00	METAL CHIP 100K 5%	1/10W	R302	1-216-097-00	METAL CHIP 100K 5%	1/10W
R204	1-216-089-00	METAL CHIP 47K 5%	1/10W	R303	1-216-055-00	METAL CHIP 1.8K 5%	1/10W
R205	1-216-085-00	METAL CHIP 33K 5%	1/10W	R304	1-216-033-00	METAL CHIP 220 5%	1/10W
R206	1-216-073-00	METAL CHIP 10K 5%	1/10W	R305	1-216-059-00	METAL CHIP 2.7K 5%	1/10W
R207	1-216-075-00	METAL CHIP 12K 5%	1/10W	R306	1-216-071-00	METAL CHIP 8.2K 5%	1/10W
R208	1-216-061-00	METAL CHIP 3.3K 5%	1/10W	R307	1-216-087-00	METAL CHIP 39K 5%	1/10W
R209	1-216-089-00	METAL CHIP 47K 5%	1/10W	R308	1-216-093-00	METAL CHIP 68K 5%	1/10W
R210	1-216-089-00	METAL CHIP 47K 5%	1/10W	R309	1-216-059-00	METAL CHIP 2.7K 5%	1/10W
R211	1-216-097-00	METAL CHIP 100K 5%	1/10W	R310	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
R212	1-216-129-00	METAL CHIP 2.2M 5%	1/10W	R311	1-216-091-00	METAL CHIP 56K 5%	1/10W
R213	1-216-061-00	METAL CHIP 3.3K 5%	1/10W	R312	1-216-089-00	METAL CHIP 47K 5%	1/10W
				R313	1-216-087-00	METAL CHIP 39K 5%	1/10W

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Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
R314	1-216-099-00	METAL CHIP	120K 5% 1/10W	R367	1-216-081-00	METAL CHIP	22K 5% 1/10W
R315	1-216-089-00	METAL CHIP	47K 5% 1/10W	R368	1-246-455-00	CARBON	180 5% 1/4W
R316	1-216-089-00	METAL CHIP	47K 5% 1/10W	R369	1-216-089-00	METAL CHIP	47K 5% 1/10W
R317	1-216-081-00	METAL CHIP	22K 5% 1/10W	R370	1-216-037-00	METAL CHIP	330 5% 1/10W
R318	1-216-097-00	METAL CHIP	100K 5% 1/10W	R371	1-216-045-00	METAL CHIP	680 5% 1/10W
R319	1-216-065-00	METAL CHIP	4.7K 5% 1/10W	R372	1-216-089-00	METAL CHIP	47K 5% 1/10W
R320	1-216-298-00	METAL CHIP	2.2 5% 1/10W	R373	1-216-045-00	METAL CHIP	680 5% 1/10W
R321	1-216-073-00	METAL CHIP	10K 5% 1/10W	R374	1-216-045-00	METAL CHIP	680 5% 1/10W
R322	1-216-113-00	METAL CHIP	470K 5% 1/10W	R375	1-216-077-00	METAL CHIP	15K 5% 1/10W
R323	1-216-113-00	METAL CHIP	470K 5% 1/10W	R376	1-216-077-00	METAL CHIP	15K 5% 1/10W
R324	1-216-051-00	METAL CHIP	1.2K 5% 1/10W	R377	1-216-035-00	METAL CHIP	270 5% 1/10W
R325	1-216-051-00	METAL CHIP	1.2K 5% 1/10W	R378	1-216-035-00	METAL CHIP	270 5% 1/10W
R326	1-216-073-00	METAL CHIP	10K 5% 1/10W	R379	1-216-081-00	METAL CHIP	22K 5% 1/10W
R327	1-216-073-00	METAL CHIP	10K 5% 1/10W	R380	1-216-085-00	METAL CHIP	33K 5% 1/10W
R328	1-216-073-00	METAL CHIP	10K 5% 1/10W	R381	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R329	1-216-105-00	METAL CHIP	220K 5% 1/10W	R382	1-216-046-00	METAL CHIP	750 5% 1/10W
R330	1-216-073-00	METAL CHIP	10K 5% 1/10W	R383	1-532-637-00	LINK, IC (ICP-N25)	
R331	1-216-089-00	METAL CHIP	47K 5% 1/10W	R384	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R332	1-216-065-00	METAL CHIP	4.7K 5% 1/10W	R385	1-216-046-00	METAL CHIP	750 5% 1/10W
R333	1-216-047-00	METAL CHIP	820 5% 1/10W	R386	1-216-046-00	METAL CHIP	750 5% 1/10W
R334	1-216-084-00	METAL CHIP	30K 5% 1/10W	R387	1-216-111-00	METAL CHIP	390K 5% 1/10W
R335	1-216-099-00	METAL CHIP	120K 5% 1/10W	R388	1-216-097-00	METAL CHIP	100K 5% 1/10W
R336	1-216-073-00	METAL CHIP	10K 5% 1/10W	R389	1-216-089-00	METAL CHIP	47K 5% 1/10W
R337	1-216-115-00	METAL CHIP	560K 5% 1/10W	R390	1-216-085-00	METAL CHIP	33K 5% 1/10W
R338	1-216-081-00	METAL CHIP	22K 5% 1/10W	R391	1-216-093-00	METAL CHIP	68K 5% 1/10W
R339	1-216-089-00	METAL CHIP	47K 5% 1/10W	R392	1-216-089-00	METAL CHIP	47K 5% 1/10W
R340	1-216-085-00	METAL CHIP	33K 5% 1/10W	R394	1-216-081-00	METAL CHIP	22K 5% 1/10W
R341	1-216-117-00	METAL CHIP	680K 5% 1/10W	R395	1-216-055-00	METAL CHIP	1.8K 5% 1/10W
R342	1-216-085-00	METAL CHIP	33K 5% 1/10W	R396	1-216-081-00	METAL CHIP	22K 5% 1/10W
R343	1-216-083-00	METAL CHIP	27K 5% 1/10W	R397	1-216-045-00	METAL CHIP	680 5% 1/10W
R344	1-216-073-00	METAL CHIP	10K 5% 1/10W	R398	1-216-113-00	METAL CHIP	470K 5% 1/10W
R345	1-216-083-00	METAL CHIP	27K 5% 1/10W	R399	1-216-099-00	METAL CHIP	120K 5% 1/10W
R346	1-216-081-00	METAL CHIP	22K 5% 1/10W	R450	1-216-107-00	METAL CHIP	270K 5% 1/10W
R347	1-216-093-00	METAL CHIP	68K 5% 1/10W	R451	1-216-105-00	METAL CHIP	220K 5% 1/10W
R348	1-216-093-00	METAL CHIP	68K 5% 1/10W	R452	1-216-107-00	METAL CHIP	270K 5% 1/10W
R349	1-216-093-00	METAL CHIP	68K 5% 1/10W	R453	1-216-073-00	METAL CHIP	10K 5% 1/10W
R350	1-216-045-00	METAL CHIP	680 5% 1/10W	R454	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R351	1-216-085-00	METAL CHIP	33K 5% 1/10W	R455	1-216-097-00	METAL CHIP	100K 5% 1/10W
R352	1-216-097-00	METAL CHIP	100K 5% 1/10W	R456	1-216-073-00	METAL CHIP	10K 5% 1/10W
R353	1-216-041-00	METAL CHIP	470 5% 1/10W	R457	1-216-081-00	METAL CHIP	22K 5% 1/10W
R354	1-247-821-00	CARBON	390 5% 1/6W	R458	1-216-097-00	METAL CHIP	100K 5% 1/10W
R355	1-247-821-00	CARBON	390 5% 1/6W	R461	1-216-092-00	METAL CHIP	62K 5% 1/10W
R356	1-216-073-00	METAL CHIP	10K 5% 1/10W	R462	1-216-115-00	METAL CHIP	560K 5% 1/10W
R357	1-216-049-00	METAL CHIP	1K 5% 1/10W	R463	1-216-113-00	METAL CHIP	470K 5% 1/10W
R358	1-216-081-00	METAL CHIP	22K 5% 1/10W	R464	1-216-097-00	METAL CHIP	100K 5% 1/10W
R359	1-246-455-00	CARBON	180 5% 1/4W	R465	1-216-089-00	METAL CHIP	47K 5% 1/10W
R360	1-216-049-00	METAL CHIP	1K 5% 1/10W	R466	1-216-065-00	METAL CHIP	4.7K 5% 1/10W
R361	1-216-081-00	METAL CHIP	22K 5% 1/10W	R467	1-216-081-00	METAL CHIP	22K 5% 1/10W
R362	1-246-455-00	CARBON	180 5% 1/4W	R468	1-216-025-00	METAL CHIP	100 5% 1/10W
R363	1-216-049-00	METAL CHIP	1K 5% 1/10W	R469	1-216-046-00	METAL CHIP	750 5% 1/10W
R364	1-216-081-00	METAL CHIP	22K 5% 1/10W	R470	1-216-046-00	METAL CHIP	750 5% 1/10W
R365	1-246-455-00	CARBON	180 5% 1/4W				
R366	1-216-049-00	METAL CHIP	1K 5% 1/10W				

NOTE:

The components identified by shading and mark **A** are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

SS-17**LM-12****DM-4****RD-8****SW-28****JK-2****TRANSLAION**

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
<u>VARIABLE RESISTOR</u>				▲:3-682-518-00 CUSHION			
RV201	1-228-760-00	RES, ADJ, METAL GLAZE 47K		<u>DIODE</u>			
RV202	1-226-772-00	RES, ADJ, METAL GLAZE 4.7K		D980	8-719-812-30	DIODE TL0123	
RV301	1-226-703-00	RES, ADJ, METAL GLAZE 10K		D981	8-719-812-31	DIODE TLR123	
RV302	1-226-774-00	RES, ADJ, METAL GLAZE 47K		D982	8-719-812-32	DIODE TLY123	
RV303	1-226-774-00	RES, ADJ, METAL GLAZE 47K		D983	8-719-812-31	DIODE TLR123	
RV304	1-226-774-00	RES, ADJ, METAL GLAZE 47K		<u>SWITCH</u>			
RV305	1-226-774-00	RES, ADJ, METAL GLAZE 47K		S980	1-554-174-00	SWITCH, KEY BOARD	
<u>CRYSTAL</u>				S981	1-554-174-00	SWITCH, KEY BOARD	
X301	1-567-192-00	OSCILLATOR, CERAMIC		*****			
*****				▲:1-609-857-00	JK-2 BOARD	*****	
▲:1-609-855-00	LM-12 BOARD	*****		▲:1-533-146-00	HOLDER, FUSE		
<u>CAPACITOR</u>				<u>CAPACITOR</u>			
C940	1-101-005-00	CERAMIC 0.022MF	50V	C901	1-124-233-00	ELECT 10MF	20% 16V
C941	1-101-005-00	CERAMIC 0.022MF	50V	<u>CONNECTOR</u>			
<u>COIL</u>				CN901▲:1-564-002-00	PIN, CONNECTOR 3P		
L940	1-407-847-00	MICRO INDUCTOR 35UH		CN902▲:1-564-005-00	PIN, CONNECTOR 6P		
*****				CN903▲:1-564-004-00	PIN, CONNECTOR 5P		
▲:1-609-866-00	DM-4 BOARD	*****		<u>FUSE</u>			
<u>CAPACITOR</u>				F901 ▲:1-532-350-00	FUSE, TIME-LAG T4A 250V		
C920	1-101-005-00	CERAMIC 0.022MF	50V	<u>JACK</u>			
C921	1-101-005-00	CERAMIC 0.022MF	50V	J901	1-507-886-00	JACK, POWER	
<u>COIL</u>				J902	1-507-885-11	JACK, MINIATURE	
L920	1-407-847-00	MICRO INDUCTOR 35UH		J903	1-507-884-00	JACK, STEREO MINIATURE	
*****				J904	1-507-885-21	JACK, MINIATURE	
▲:1-609-860-00	RD-8 BOARD	*****		<u>RESISTOR</u>			
<u>DIODE</u>				R901	1-247-799-00	CARBON 47 5% 1/6W	
D901	8-719-921-03	DIODE GP-2S02B		*****			
<u>TRANSISTOR</u>				▲:1-610-605-00	TRANSLATION BOARD	*****	
Q901	8-729-102-78	TRANSISTOR 2SB962		2-523-713-00	TERMINAL		
*****				<u>CAPACITOR</u>			
▲:1-610-180-00	SW-28 BOARD	*****		C101	1-163-205-21	CERAMIC CHIP 0.001MF 10%	50V
▲:3-670-095-00	HOLDER, LED			<u>CONNECTOR</u>			
▲:3-681-570-00	HOLDER, LED			CNP101	1-564-001-11	PIN, CONNECTOR 2P	
				<u>TRANSISTOR</u>			
				Q101	8-729-700-06	TRANSISTOR NJM2056-4	

NOTE:

The components identified by shading and mark ▲ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref.No.	Part No.	Description	Remark
MISCELLANEOUS			

	1-556-970-00	CONNECTOR ASSY (2.0MM) 3P	
	1-562-325-00	SOCKET ASSY, IMAGE PICKUP TUBE	
	1-806-682-00	SENSOR, DEW CONDENSATION	
	8-814-165-01	MICROPHONE, BUILT-IN (C-2003)	
	8-814-173-00	MICROPHONE, BUILT-IN (CU11-01)	
	8-825-561-10	HEAD, ERAZE (EF254-21)	
	8-701-032-29	CT-3222	
M901	8-835-098-01	MOTOR, DC (DNR-6600A) (LOADING)	
M902	8-835-099-01	MOTOR, DC (MNR-5003A) (DRUM)	
PM901A	1-454-357-11	SOLENOID, PLUNGER (BRAKE)	
PM902A	1-454-357-21	SOLENOID, PLUNGER (PINCH)	
Q851 A	8-729-177-22	TRANSISTOR 2SB772	
S301	1-554-582-00	SWITCH, MICRO (CASSETTE IN)	
S302	1-554-582-00	SWITCH, MICRO (CASSETTE DOWN)	
S303	1-554-581-00	SWITCH, MICRO (LOADING END)	
S930	1-554-561-00	SWITCH, TACT (REC)	
S931	1-554-560-00	SWITCH, SEESAW (ZOOM)	

ACCESSORIES AND PACKING MATERIALS			

Part No.	Description	Remark	
A-6701-361-A	BELT ASSY, SHOULDER		
1-504-044-00	EARPHONE, MAGNETIC (ME-21)		
3-532-616-00	BAG, POLYETHYLENE		
3-681-680-00	COVER, MICROPHONE		
3-682-534-00	CUSHION (UPPER)		
3-682-535-00	CUSHION (LOWER)		
3-682-541-11	INDIVIDUAL CARTON		
3-682-561-00	PAD AEP		
3-773-534-11	MANUAL, INSTRUCTION (English) AEP, UK		
3-773-534-51	MANUAL, INSTRUCTION (French, Germany) AEP		
3-773-534-61	MANUAL, INSTRUCTION (Dutch, Swedish) AEP		
3-773-534-71	MANUAL, INSTRUCTION (Spanish, Italian) AEP		
3-773-534-81	MANUAL, INSTRUCTION (English, Arabic) E		
3-682-536-00	CUSHION (A), BLOCK (BMC-100PK)		
3-682-537-00	CUSHION (B), BLOCK (BMC-100PK)		
3-682-538-00	PAD (BMC-100PK)		
3-682-539-00	SPACER (BMC-100PK)		

NOTE:

The components identified by shading and mark **A** are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

AC-M100E/M100UB/M110E

SERVICE MANUAL



(AC-M100UB)

AEP Model
(AC-M100E)

UK Model
(AC-M100UB)

E Model
(AC-M110E)

SPECIFICATIONS

Power requirements	110–240 V ac, 50/60 Hz
Power consumption	26 W
Output voltage	9.6 V dc
Output current	1.0 A
Charging voltage	14 V dc
Charging current	1.2 A
Rechargeable battery	NP-11
Operating temperatures	0°C to 40°C (32°F to 104°F)
Storage temperatures	–20°C to +65°C (–4°F to 149°F)
Dimensions	Approx. 88 × 78 × 212 mm (w/h/d) (3½ × 3⅛ × 8⅜ inches)
Weight	Approx. 1.1 kg (2 lb 7 oz) net
Cord length	Mains lead: Approx. 2.2 m (7.2 feet) DC OUT cord: Approx. 2 m (6.5 feet)
Supplied accessory	AC plug adaptor (1) . . . AC-M110E (E Model) only

AC POWER ADAPTOR
SONY®

SECTION 1 OUTLINE

1-1. FEATURES

The AC-M100E/M100UB/M110E ac power adaptor is designed to enable the BMC-100 or BMC-100P Betamovie to operate from house current. It can also be used for charging the NP-11 battery pack.

1-2. PRECAUTIONS

On safety

- This ac power adaptor operates on 110–240V ac without any voltage adaptation.

FOR AC-M100UB (UK MODEL)

IMPORTANT

The wires in the mains lead are coloured in accordance with the following code:

Blue: Neutral

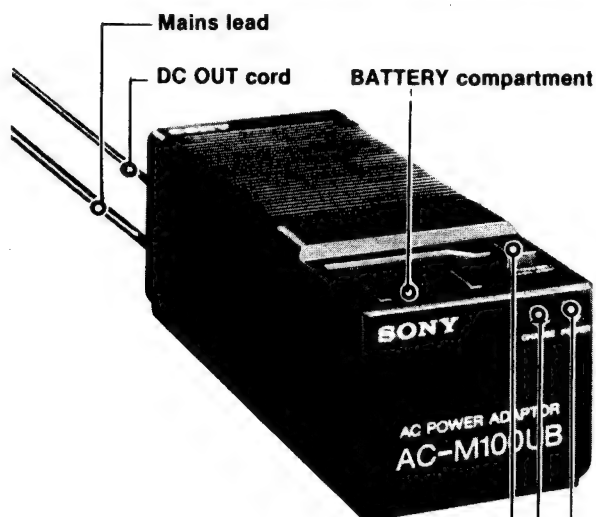
Brown: Live

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.

The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

1-3. LOCATION AND FUNCTION OF PARTS



POWER button

Push down to turn the unit on.
If a battery pack is inserted, charging starts.

CHARGE lamp

Lights (orange) while the inserted battery pack is being charged.

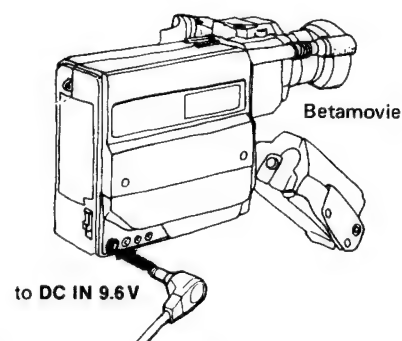
POWER lamp

Lights (green) when the power is turned on.

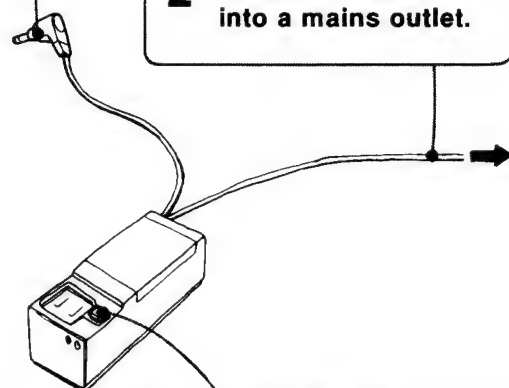
1-4. INSTRUCTION

AC POWER OPERATION OF THE BETAMOVIE

- 1 Connect the DC OUT cord to the Betamovie.



- 2 Plug the mains lead into a mains outlet.



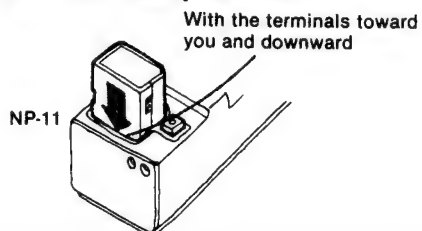
- 3 Press the POWER button.

The POWER lamp lights green when the unit is turned on.

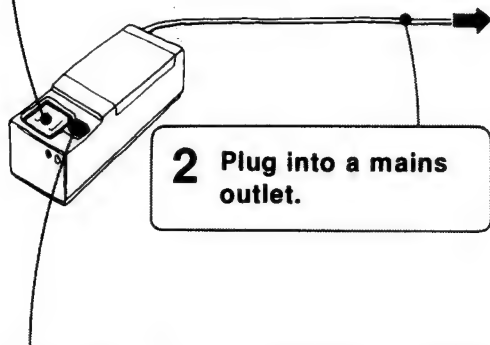
To turn the Betamovie on and off, press the POWER button of the Betamovie.

CHARGING THE BATTERY PACK

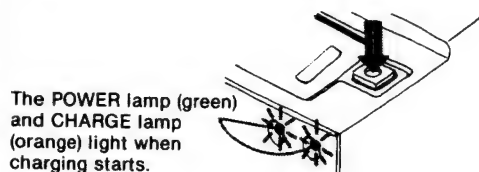
1 Install a battery pack in the BATTERY compartment.



2 Plug into a mains outlet.



3 Press the POWER button.



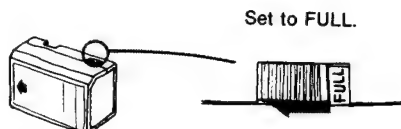
Charging time at normal temperature
NP-11: Approx. 1 hour

When the battery has been fully charged

The charging will stop automatically and the CHARGE lamp will go off.

Turn the adaptor off and remove the battery pack.

The FULL/EMP indicator



The charging temperature range

The battery pack can be charged from 5°C to 40°C (41°F to 104°F).

The Betamovie cannot be operated during charging.

If the POWER button is pressed when there is a battery pack in the BATTERY compartment, the adaptor is automatically set to the charging mode and power is not supplied to the Betamovie.

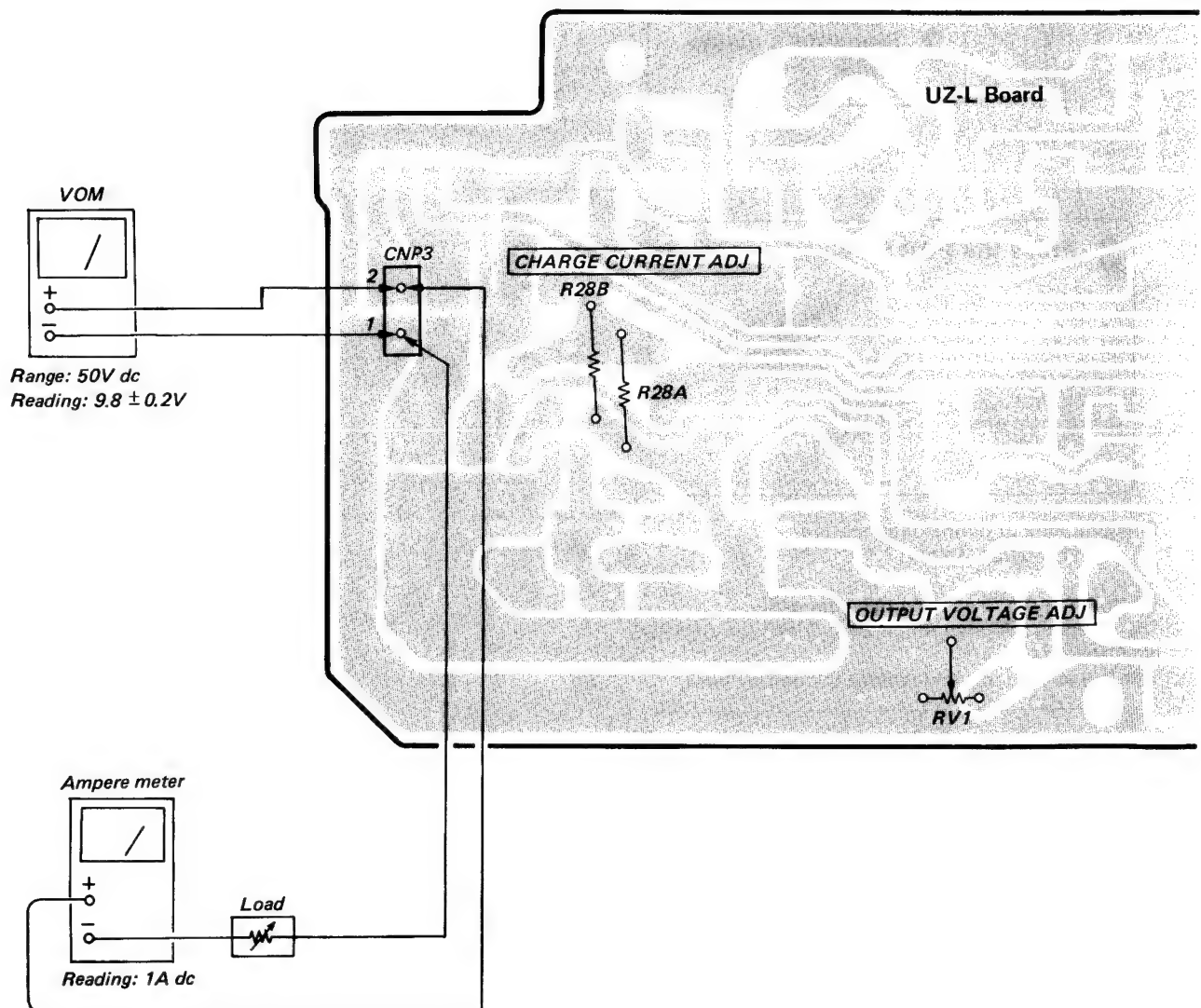
SECTION 2 ADJUSTMENTS

OUTPUT VOLTAGE ADJ

- 1) Connect a VOM and ampere meter as shown below.
- 2) Adjust RV1 for $9.8 \pm 0.2V$ dc on the VOM.

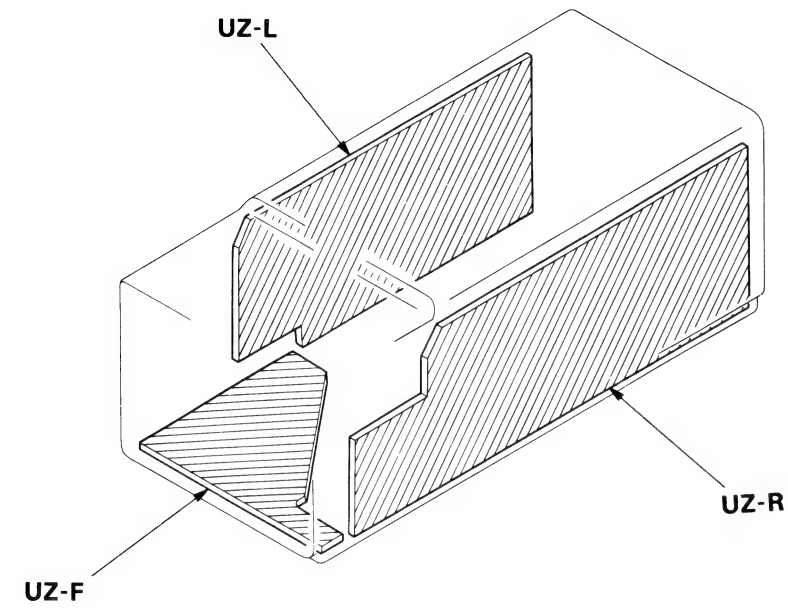
CHARGE CURRENT ADJ

- 1) Short-circuit between two battery terminals on UZ-F board.
- 2) Mount or disconnect a $12k\Omega$ $\frac{1}{4}W$ carbon resistor (R28B) as shown below, so that the charge current is $1.25 \pm 0.2A$.

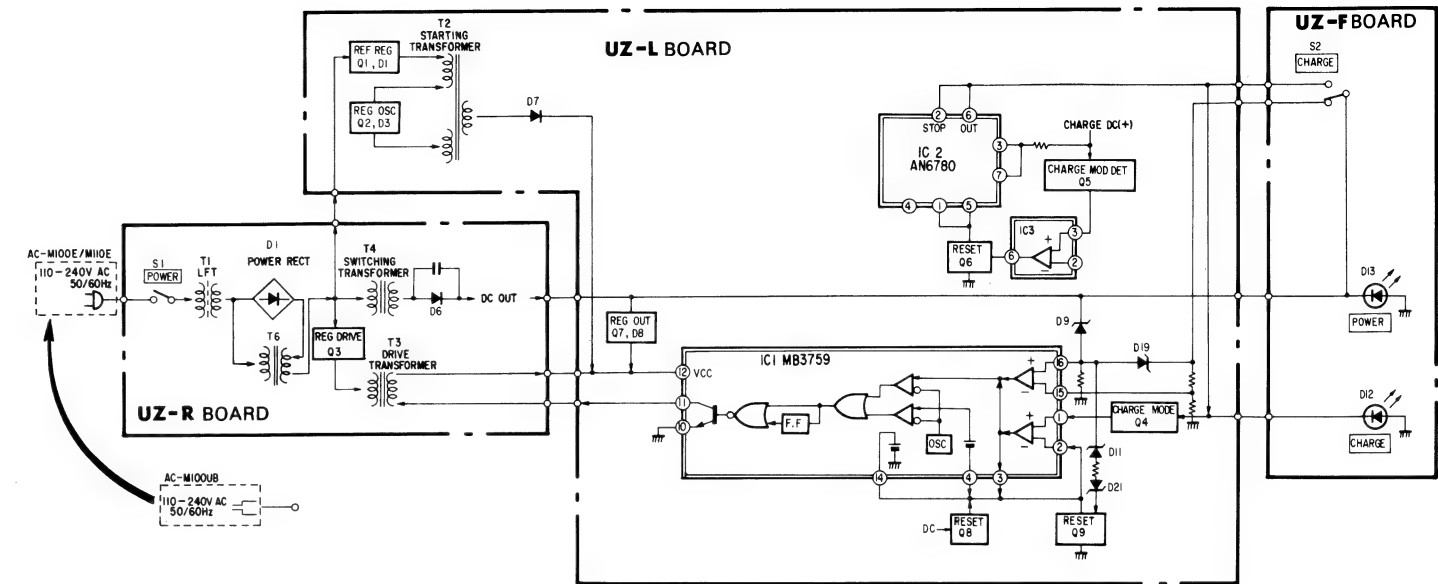


SECTION 3 DIAGRAMS

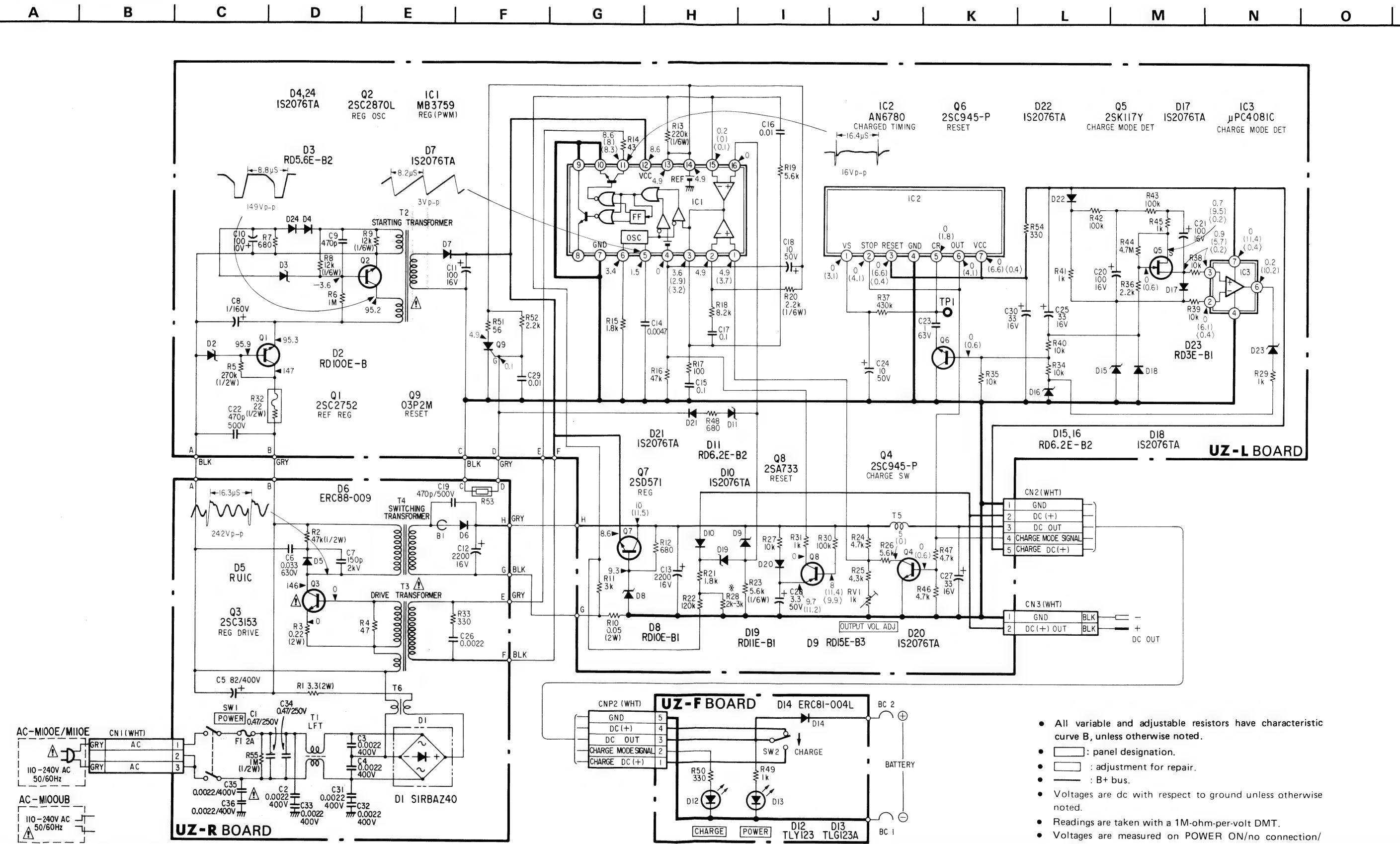
3-1. CIRCUIT BOARDS LOCATION



3-2. BLOCK DIAGRAM



3-3. SCHEMATIC DIAGRAM



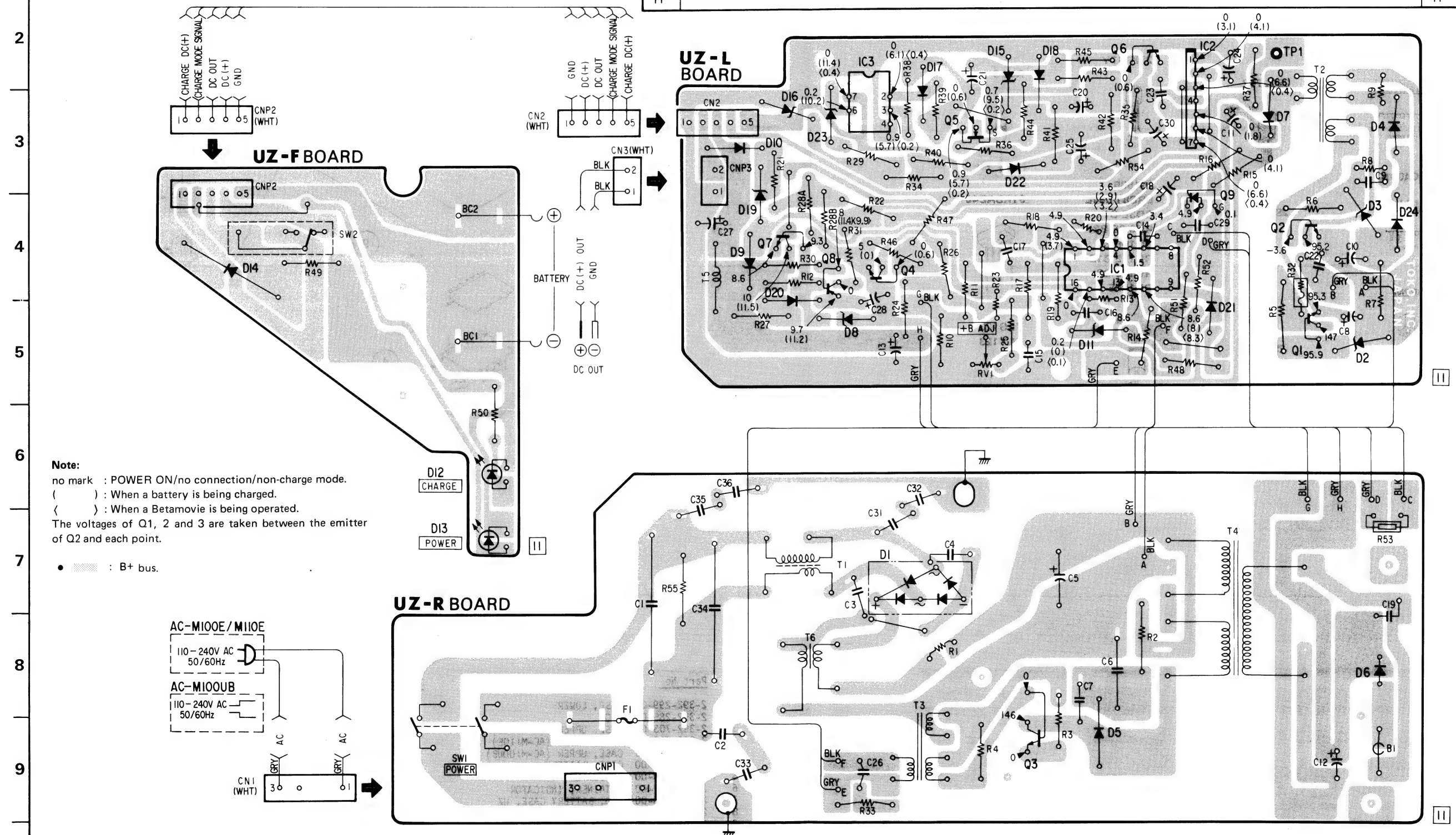
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
 - : panel designation.
 - : adjustment for repair.
 - : B+ bus.
 - Voltages are dc with respect to ground unless otherwise noted.
 - Readings are taken with a 1M-ohm-per-volt DMT.
 - Voltages are measured on POWER ON/no connection/non-charge mode.
 - () : measured when a battery is being charged.
 - < > : measured when a Betamovie is being operated.
- The voltages of Q1, 2 and 3 are taken between the emitter of Q2 and each point.

Note:

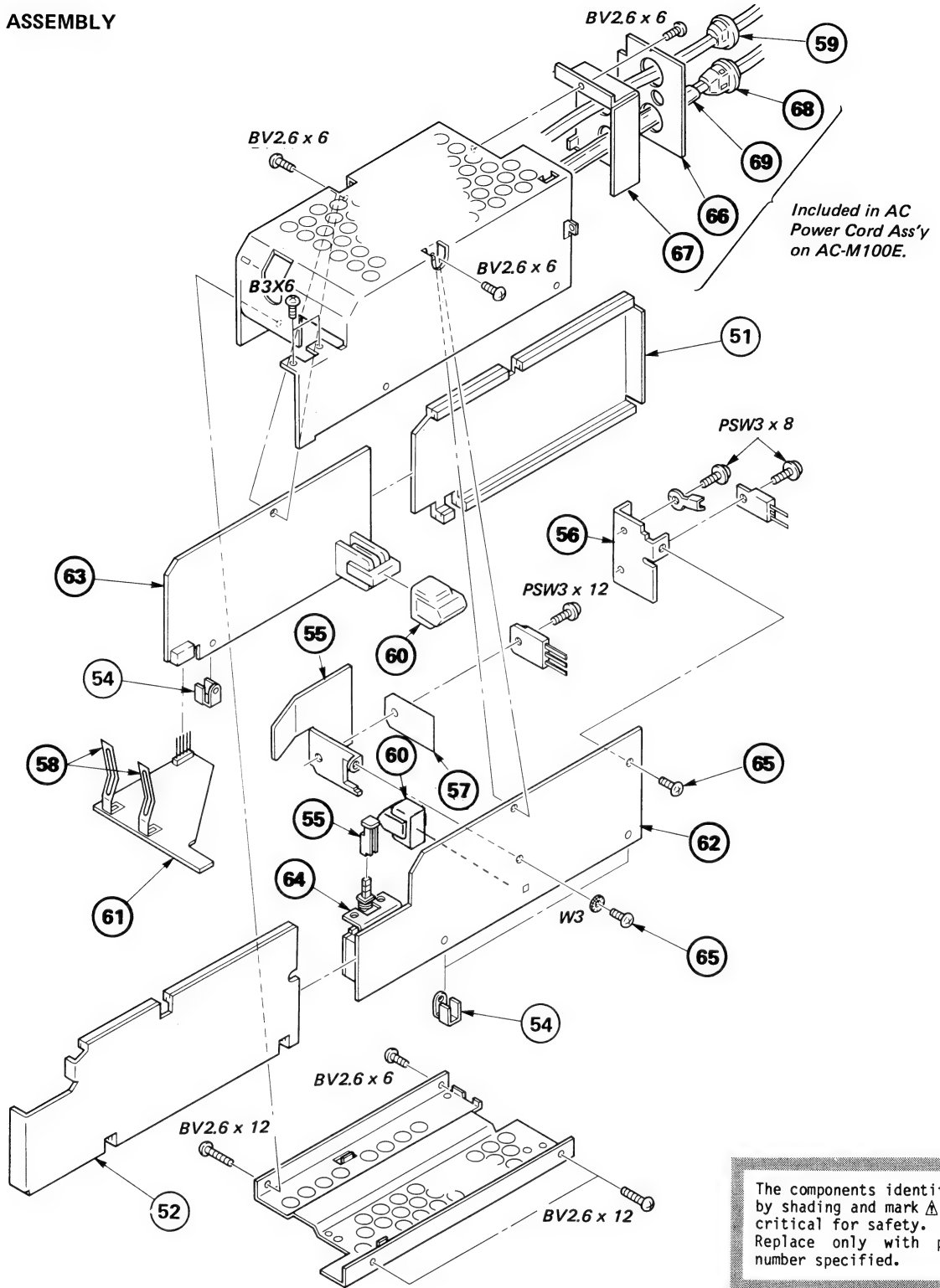
- All capacitors are in μF unless otherwise noted. pF : μF 50WV or less are not indicated except for electrolytics.
- All resistors are in ohms, $\frac{1}{4}\text{W}$ unless otherwise noted. k : 1000 Ω , M : 1000k Ω

UZ-F UZ-R UZ-L UZ-R

Q IC	7 8 IC3 5 6 IC2 2 4 9 1										Q IC
D	10 19 16 23 17 15 18 11 21 7 2 3 4 24 9 20 8 22										D
ADJ	RV1										ADJ
TP	I										TP



4-2. CHASSIS ASSEMBLY



No.	Part No.	Description
51	Δ:2-392-295-00	INSULATOR (LEFT)
52	Δ:2-392-296-00	INSULATOR (RIGHT)
53	2-392-281-00	SHAFT
54	2-392-702-00	BRACKET, GROUND
55	Δ:2-392-282-00	HEAT SINK (T)
56	Δ:2-392-283-00	HEAT SINK (D)
57	2-392-701-00	SHEET, INSULATING
58	2-392-284-00	TERMINAL, BATTERY
59	2-231-019-00	BUSHING, DC CORD
60	4-886-828-00	COVER, LFT

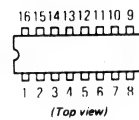
No.	Part No.	Description	Remark
61	Δ:1-610-645-00	UZ-F BOARD	
62	Δ:1-611-263-00	UZ-R BOARD	
63	Δ:1-611-264-00	UZ-L BOARD	
64	Δ:1-553-834-21	SWITCH, POWER (SW1)	
65	2-291-546-00	SCREW (3X6), SMALL	
66	2-392-717-00	PLATE (E), ORNAMENTAL, REAR PANEL	
67	Δ:2-392-718-00	PANEL (E), REAR (AC-M100UB/M110E)	
68	Δ:2-234-904-00	BUSHING, AC CORD (AC-M100UB/M110E)	
69	Δ:9-983-573-01	TUBE, VINYL (AC-M100UB/M110E)	

3-5. SEMICONDUCTORS

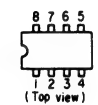
AN6780



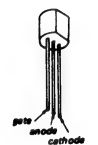
MB3759



μPC4081C



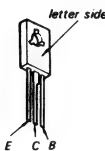
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2SA1027R
2SC945-P



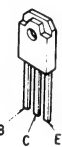
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2SC2870L



2SC3153



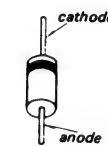
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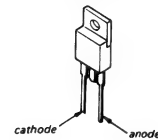
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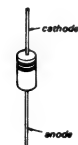
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ERC81-004L
RD3E-B1
RD6.2E-B2
RD10E-B1
RD11E-B1Z
RD15E-B3
RD100E



ERC88-009



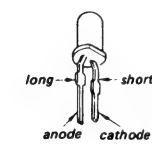
RU1C



S1RBAZ40



TLG123
TLY123



SECTION 4 EXPLODED VIEWS

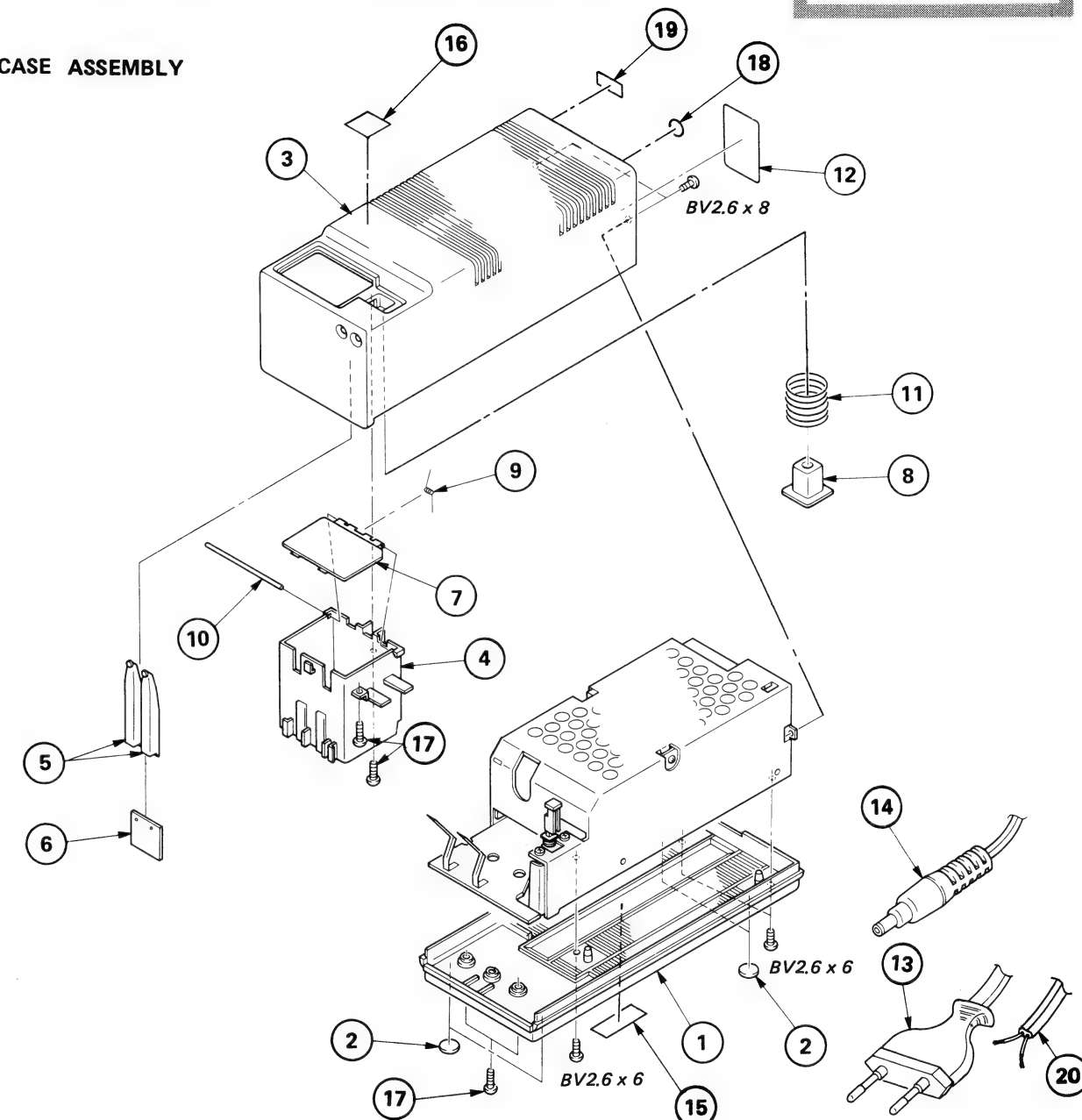
NOTE:

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.

- Items marked "▲" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The components identified by shading and mark ▲ are critical for safety. Replace only with part number specified.

4-1. CASE ASSEMBLY



No.	Part No.	Description
1	2-392-299-00	CASE, LOWER
2	2-392-285-00	FOOT
3	2-392-703-05	CASE, UPPER (AC-M100E)
	2-392-703-04	CASE, UPPER (AC-M110E)
	2-392-703-06	CASE, UPPER (AC-M100UB)
4	2-392-704-00	CASE, BATTERY
5	2-392-286-00	INDICATOR, UZ
6	2-392-287-00	RETAINER, INDICATOR
7	2-392-288-00	LID, BATTERY CASE, UZ
8	2-392-289-00	BUTTON, UZ
9	2-392-290-00	SPRING, TORSION
10	2-392-291-00	SHAFT
11	2-392-292-00	SPRING, COMPRESSION

No.	Part No.	Description	Remark
12	▲2-392-715-00	LABEL, MODEL NUMBER (AC-M100E)	
	▲2-392-716-00	LABEL, MODEL NUMBER (AC-M110E)	
	▲2-392-719-00	LABEL, MODEL NUMBER (AC-M100UB)	
13	▲9-983-645-01	CORD ASSY, POWER (AC-M100E/M110E)	66,67 68,69
14	1-557-111-00	CORD, DC OUTPUT	
15	3-703-043-21	LABEL, CAUTION, MAIN	
16	3-703-710-01	STICKER, SONY SYMBOL	
17	9-983-575-01	SCREW +BV2.6X10	
18	3-701-940-01	LABEL, BEAB (AC-M100UB)	
19	3-703-676-01	LABEL, APPROVAL (AC-M100E)	
20	▲9-983-588-01	MAINS LEAD (AC-M100UB)	

HARDWARE LIST

SCREW

7-682-547-04	SCREW +B 3X6
7-682-948-01	SCREW +PSW 3X8
7-682-950-01	SCREW +PSW 3X12
7-685-862-01	SCREW +BVTT 2.6X6 (S)
7-685-862-09	SCREW +BVTT 2.6X6 (S)
7-685-863-09	SCREW +BVTT 2.6X8 (S)
7-685-865-01	SCREW +BVTT 2.6X12 (S)

WASHER

7-623-422-07	LW 3, TYPE B
--------------	--------------

SECTION 5 ELECTRICAL PARTS LIST

UZ-L

NOTE:

The components identified by shading and mark Δ are critical for safety. Replace only with part number specified.

• =>: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

• Items marked " Δ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

• All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

CAPACITORS
• MF : μ F, PF : μ PF

RESISTORS
• All resistors are in ohms
• F : nonflammable

COILS
• MMH : mH, UH : μ H

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
	Δ 1-611-264-00	UZ-L BOARD *****				IC	
		CAPACITOR		IC1	8-759-937-59	IC MB3759	
C8	9-982-786-01	ELECT 1MF	160V	IC2	9-983-564-01	IC AN6780	
C9	1-102-114-00	CERAMIC 470PF	50V	IC3	8-759-101-30	IC UPC4081C	
C10	1-123-307-00	ELECT 100MF	10V			TRANSISTOR	
C11	1-123-320-00	ELECT 100MF	16V	Q1	8-729-175-22	TRANSISTOR 2SC2752	
C13	9-983-553-01	ELECT 2200MF	16V	Q2	9-983-561-01	TRANSISTOR 2SC2870L	
C14	1-108-234-00	PE TEREPHTHALATE 0.0047MF	50V	Q4	8-729-194-57	TRANSISTOR 2SC945-P	
C15	1-108-251-00	PE TEREPHTHALATE 0.1MF	50V	Q5	8-729-201-16	TRANSISTOR 2SK117Y	
C16	1-108-239-00	PE TEREPHTHALATE 0.01MF	50V	Q6	8-729-194-57	TRANSISTOR 2SC945-P	
C17	1-108-251-00	PE TEREPHTHALATE 0.1MF	50V	Q7	=>8-729-177-43	TRANSISTOR 2SD774	
C18	1-123-356-00	ELECT 10MF	50V	Q8	=>8-729-612-77	TRANSISTOR 2SA1027R	
C20	1-123-320-00	ELECT 100MF	16V	Q9	9-983-563-01	THYRISTOR 03P2M	
C21	1-123-320-00	ELECT 100MF	16V			RESISTOR	
C22	9-982-783-01	CERAMIC 470PF	500V	R5	1-244-931-00	CARBON 270K	1/2W
C23	9-983-554-01	FILM 1MF	63V	R6	1-246-545-00	CARBON 1M	1/4W
C24	1-123-356-00	ELECT 10MF	50V	R7	1-246-469-00	CARBON 680	1/4W
C25	1-123-318-00	ELECT 33MF	16V	R8	1-247-857-00	CARBON 12K	1/6W
C27	1-123-318-00	ELECT 33MF	16V	R9	1-247-857-00	CARBON 12K	1/6W
C28	1-123-354-00	ELECT 3.3MF	50V	R10	1-217-596-00	METAL PLATE 0.05	2W
C29	1-102-129-00	CERAMIC 0.01MF	50V	R11	1-246-484-00	CARBON 3K	1/4W
C30	1-123-318-00	ELECT 33MF	16V	R12	1-246-469-00	CARBON 680	1/4W
		CONNECTOR		R13	1-247-887-00	CARBON 220K	1/6W
CN2	Δ 9-983-570-01	HOUSING, CONNECTOR (5P)		R14	1-246-440-00	CARBON 43	1/4W
		PLUG		R15	1-246-479-00	CARBON 1.8K	1/4W
CNP3	Δ 9-983-571-01	PIN, CONNECTOR (2P)		R16	1-246-513-00	CARBON 47K	1/4W
		DIODE		R17	1-246-449-00	CARBON 100	1/4W
D2	8-719-110-00	DIODE RD100E-B		R18	1-246-495-00	CARBON 8.2K	1/4W
D3	8-719-156-25	DIODE RD5.6E-B2Z		R19	1-246-491-00	CARBON 5.6K	1/4W
D4	=>8-719-815-55	DIODE 1S1585		R20	1-247-839-00	CARBON 2.2K	1/6W
D7	=>8-719-815-55	DIODE 1S1585		R21	1-246-479-00	CARBON 1.8K	1/4W
D8	8-719-100-56	DIODE RD10E-B1		R22	1-246-523-00	CARBON 120K	1/4W
D9	8-719-100-72	DIODE RD15E-B3		R23	1-247-849-00	CARBON 5.6K	1/6W
D10	=>8-719-815-55	DIODE 1S1585		R24	1-246-489-00	CARBON 4.7K	1/4W
D11	8-719-100-38	DIODE RD6.2E-B2		R25	1-246-488-00	CARBON 4.3K	1/4W
D15	8-719-100-38	DIODE RD6.2E-B2		R26	1-246-491-00	CARBON 5.6K	1/4W
D16	8-719-100-38	DIODE RD6.2E-B2		R27	1-246-497-00	CARBON 10K	1/4W
D17	=>8-719-815-55	DIODE 1S1585		R28A	1-246-483-00	CARBON 2.7K	1/4W
D18	=>8-719-815-55	DIODE 1S1585		R28B	1-246-499-00	CARBON 12K	1/4W
D19	8-719-100-60	DIODE RD11E-B1		R29	1-246-473-00	CARBON 1K	1/4W
D20	=>8-719-815-55	DIODE 1S1585		R30	1-246-521-00	CARBON 100K	1/4W
D21	=>8-719-815-55	DIODE 1S1585		R31	1-246-473-00	CARBON 1K	1/4W
D22	=>8-719-815-55	DIODE 1S1585		R32	1-212-865-00	FUSE 22	1/2W
D23	8-719-100-14	DIODE RD3.0E-B1		R34	1-246-497-00	CARBON 10K	1/4W
D24	=>8-719-815-55	DIODE 1S1585		R35	1-246-497-00	CARBON 10K	1/4W
				R36	1-246-481-00	CARBON 2.2K	1/4W
				R37	1-246-536-00	CARBON 430K	1/4W
				R38	1-246-497-00	CARBON 10K	1/4W
				R39	1-246-497-00	CARBON 10K	1/4W
				R40	1-246-497-00	CARBON 10K	1/4W

UZ-L

UZ-R

UZ-F

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
R41	1-246-473-00	CARBON 1K	1/4W	<u>DIODE</u>			
R42	1-246-521-00	CARBON 100K	1/4W	D1	▲ 9-983-559-01	DIODE 1SRBAZ40	
R43	1-246-521-00	CARBON 100K	1/4W	D5	8-719-300-80	DIODE RU1C	
R44	9-983-557-01	CARBON 4.7M	1/4W	D6	9-983-560-01	DIODE ERC88-009	
R45	1-246-473-00	CARBON 1K	1/4W	<u>FUSE</u>			
R46	1-246-489-00	CARBON 4.7K	1/4W	F1	▲ 1-532-203-00	FUSE, 2A 250V	
R47	1-246-489-00	CARBON 4.7K	1/4W	<u>TRANSISTOR</u>			
R48	1-246-469-00	CARBON 680	1/4W	Q3	▲ 8-729-801-69	TRANSISTOR 2SC3153	
R51	1-246-443-00	CARBON 56	1/4W	<u>RESISTOR</u>			
R52	1-246-481-00	CARBON 2.2K	1/4W	R1	9-983-555-01	CEMENT 3.3	2W
R53	9-983-558-01	THERMISTOR (POSITIVE)		R2	1-244-913-00	CARBON 47K	1/2W
R54	1-246-661-00	CARBON 330	1/4W	R3	9-983-556-01	CEMENT 0.22	2W
<u>VARIABLE RESISTOR</u>				R4	1-246-441-00	CARBON 47	1/4W
RV1	1-224-660-21	ADJ, METAL FILM 1K-B		R33	1-246-461-00	CARBON 330	1/4W
<u>TRANSFORMER</u>				R55	▲ 1-202-645-00	SOLID 1M	1/2W
T2	▲ 1-437-140-00	TRANSFORMER, STARTING		<u>SWITCH</u>			
T5	9-983-567-01	COIL, CHOKE		SW1	▲ 1-553-834-21	SWITCH, POWER	
*****				<u>TRANSFORMER</u>			
▲ 1-611-263-00 UZ-R BOARD				T1	▲ 1-408-941-00	COIL, CHOKE	
*****				T3	▲ 1-437-136-00	TRANSFORMER, DRIVE	
1-533-087-00 HOLDER, FUSE				T4	▲ 1-437-138-00	TRANSFORMER, SWITCHING	
<u>RING</u>				T6	▲ 1-408-941-00	COIL, CHOKE	
B1	9-983-568-01	RING, FERRITE BEAD		*****			
<u>CAPACITOR</u>				▲ 1-610-645-00 UZ-F BOARD			
C1	▲ 1-130-712-00	FILM 0.47MF	250V	*****			
C2	▲ 1-161-742-00	CERAMIC 2200PF	400V	2-392-284-00 TERMINAL, BATTERY			
C3	▲ 1-161-742-00	CERAMIC 2200PF	400V	<u>PLUG</u>			
C4	▲ 1-161-742-00	CERAMIC 2200PF	400V	CNP2	▲ 9-983-569-01	PIN, CONNECTOR (5P)	
C5	▲ 9-983-550-01	ELECT 82MF	400V	<u>DIODE</u>			
C6	9-983-551-01	FILM 0.033MF	630V	D12	8-719-812-32	DIODE TLY123	
C7	9-983-552-01	CERAMIC 150PF	2KV	D13	8-719-812-33	DIODE TLG123A	
C12	9-983-553-01	ELECT 2200MF	16V	D14	8-719-981-00	DIODE ERC81-004	
C19	9-982-783-01	CERAMIC 470PF	500V	<u>RESISTOR</u>			
C26	1-108-230-00	PE TEREPHTHALATE 0.0022MF	50V	R49	1-246-473-00	CARBON 1K	1/4W
C31	▲ 1-161-742-00	CERAMIC 2200PF	400V	R50	1-246-461-00	CARBON 330	1/4W
C32	▲ 1-161-742-00	CERAMIC 2200PF	400V	<u>SWITCH</u>			
C33	▲ 1-161-742-00	CERAMIC 2200PF	400V	SW2	9-983-566-01	SWITCH, MINIATURE	
C34	▲ 1-130-712-00	FILM 0.47MF	250V				
C35	▲ 1-161-742-00	CERAMIC 2200PF	400V				
C36	▲ 1-161-742-00	CERAMIC 2200PF	400V				
<u>PLUG</u>							
CNP1	▲ 1-560-676-00	PIN, CONNECTOR (3P)					

NOTE:

The components identified by shading and mark ▲ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

<u>Ref.No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remark</u>
		MISCELLANEOUS *****	
	1-557-111-00	CORD, DC OUTPUT	
	▲ 9-983-588-01	MAINS LEAD (AC-M100UB)	
	▲ 9-983-645-01	CORD ASSY, POWER (AC-M100E/M110E)	
CN1	▲ 1-561-777-00	HOUSING, CONNECTOR 3P (AC-M100UB/M110E)	

ACCESSORIES AND PACKING MATERIALS

<u>Part No.</u>	<u>Description</u>	<u>Remark</u>
1-506-409-00	ADAPTOR, AC PLUG (AC-M110E)	
2-366-916-00	CUSHION	
2-366-919-00	BAG, PROTECTION	
2-392-728-11	INDIVIDUAL CARTON (AC-M110E)	
2-392-728-21	INDIVIDUAL CARTON (AC-M100E)	
2-392-728-31	INDIVIDUAL CARTON (AC-M100UB)	
3-773-555-11	MANUAL, INSTRUCTION (AC-M100E)	
3-773-555-41	MANUAL, INSTRUCTION (AC-M110E)	
3-773-555-51	MANUAL, INSTRUCTION (AC-M100UB)	

NOTE:

The components identified by shading and mark ▲ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

BMC-100P/100PK
AC POWER ADAPTOR

BMC-100P/100PK

SONY ADJUSTMENT MANUAL

CORRECTION-1

File this CORRECTION-1 with the adjustment manual.

AEP Model
(BMC-100P)

UK Model
(BMC-100PK)

E Model
(BMC-100PK)

May, 1984

 : Corrected portion

CORRECT

Page 5

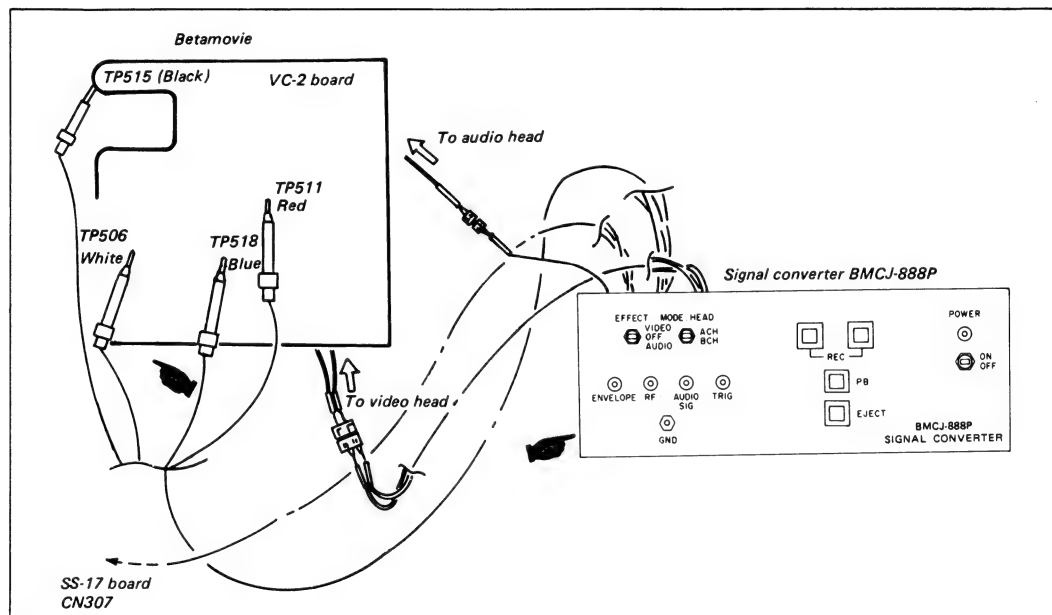


Fig. 1-4

INCORRECT

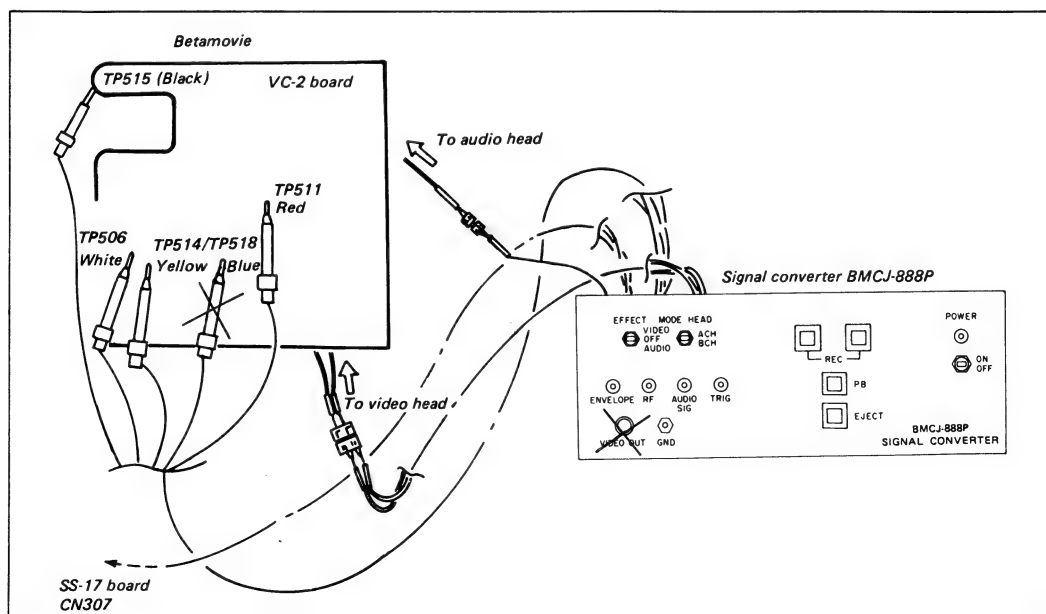


Fig. 1-4



9-972-284-92

Consumer
VIDEO

English
84E0488-1
Printed in Japan
© 1984

BMC-100P/100PK

SONY[®] SERVICE MANUAL

AEP Model
UK Model
E Model

June, 1985

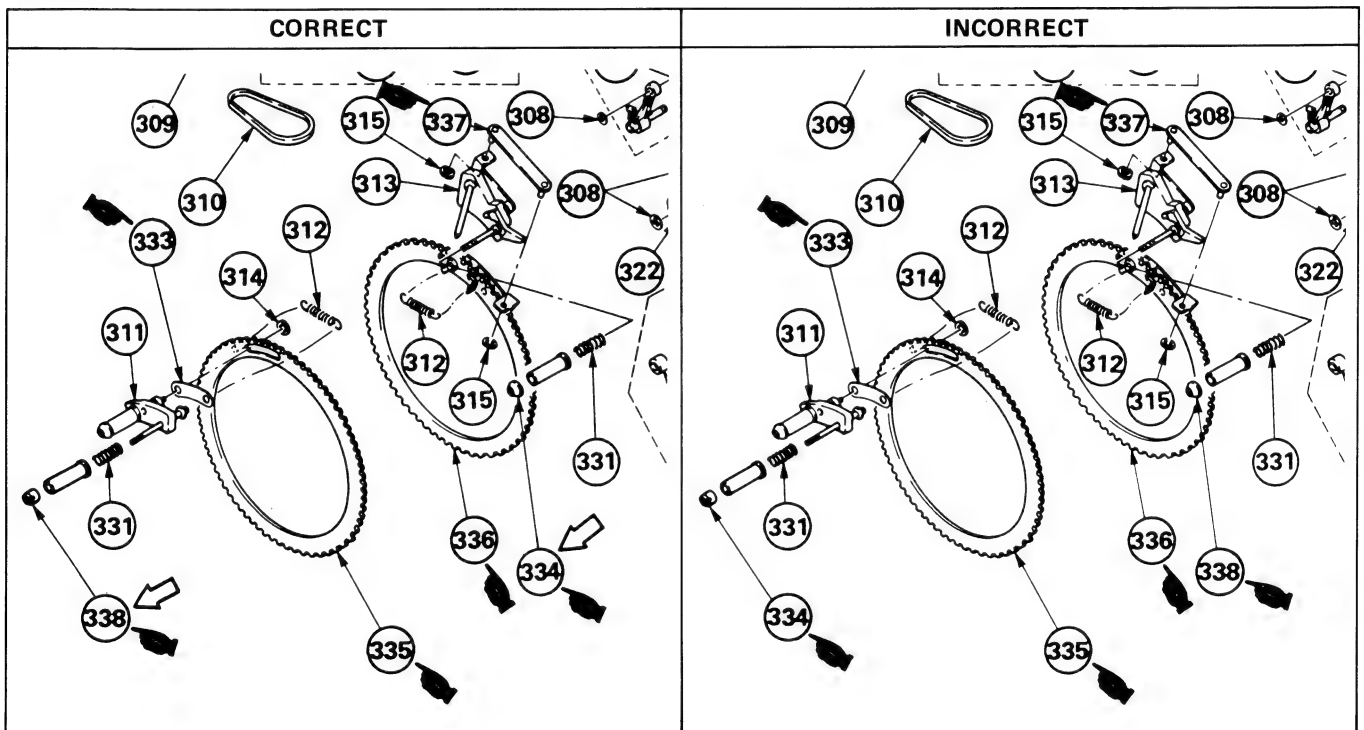
CORRECTION-4

- There is mistake in the Supplement-1 (9-972-284-82).
Please correct.
- File this Correction with the Supplement-1.

Supplement-1 Page 7

5-7. THREADING ASSEMBLY

← : Corrected Portion



9-972-284-95



Sony Corporation

English
85F0468-1
Printed in Japan
© 1985

BMC-100P/100PK

AC POWER ADPTOR

SONY[®]

SERVICE MANUAL

AEP Model
UK Model
E Model

April, 1984

SUPPLEMENT-1

File this supplement-1 with the service manual.

**Subject: Change and Correction of
BMC-100P/100PK Repair Part Names**

(1) Change of names for GC-4 and GC-5 board names

Previous name		New name
GC-4 Board	→	GC-6 Board
GC-5 Board	→	GC-7 Board

(2) Cautions required due change in zoom lens ass'y

(3) Addition and change of repair parts

(4) There were some mistakes in the names of the semiconductor products. Please correct.

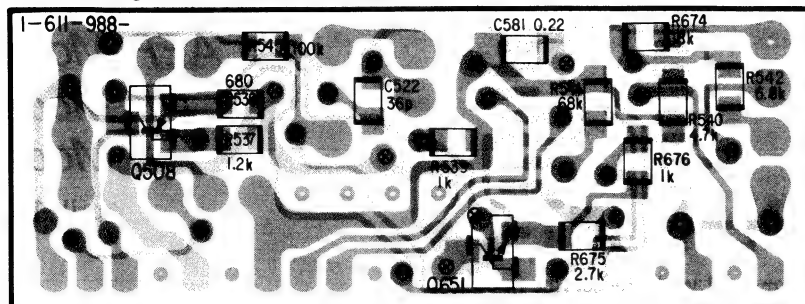


(1) Change of names for GC-4 and GC-5 board names

Page 59, 60

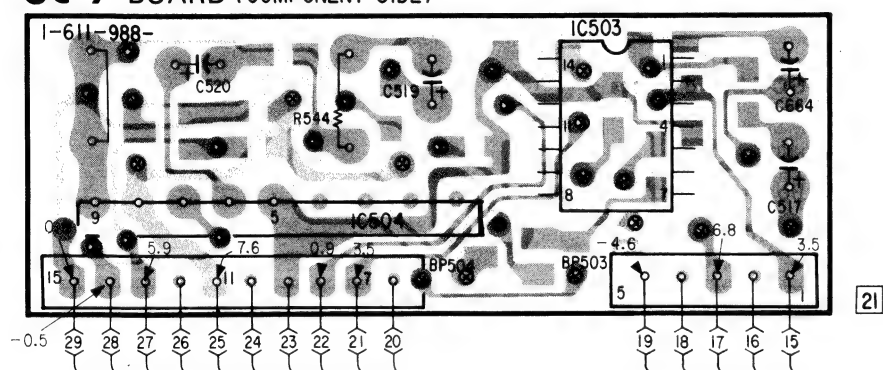
The patterns of the GC-4 and GC-5 boards have been slightly modified, and their part Nos. have also been changed.

GC-7 BOARD (CONDUCTOR SIDE)



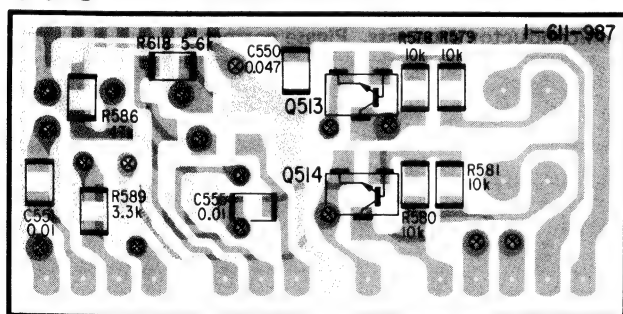
21

GC-7 BOARD (COMPONENT SIDE)



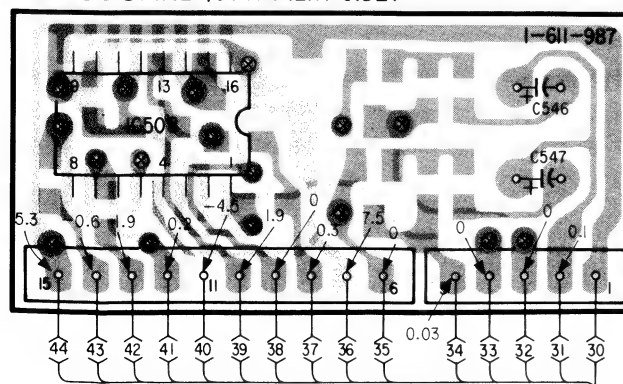
21

GC-6 BOARD (CONDUCTOR SIDE)



21

GC-6 BOARD (COMPONENT SIDE)



21

Board	Part No.
GC-6	1-611-987-21
GC-7	1-611-988-21

(2) Cautions required due change in zoom lens ass'y

In consequence of the change in zoom lens ass'y (401), now, lens cabinet (10) requires different treatments according to the ass'y versions.

With the zoom lens ass'ies with the shipping mark label codes ending in I or subsequent alphabetic letters in red stamp (Fig. 2), the following lens cabinet should be used.

X-3681-485-1 Lens Cabinet (TL) Ass'y

Note that the zoom lens ass'ies with the mark codes ending in A through H in black stamp are used with the previous lens cabinets.

X-3681-442-0 Lens Cabinet (T) Ass'y

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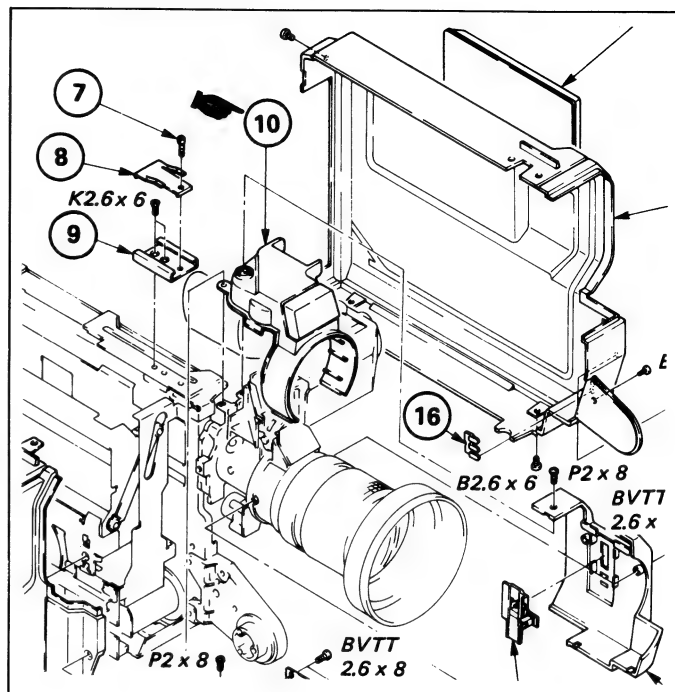


Fig. 1

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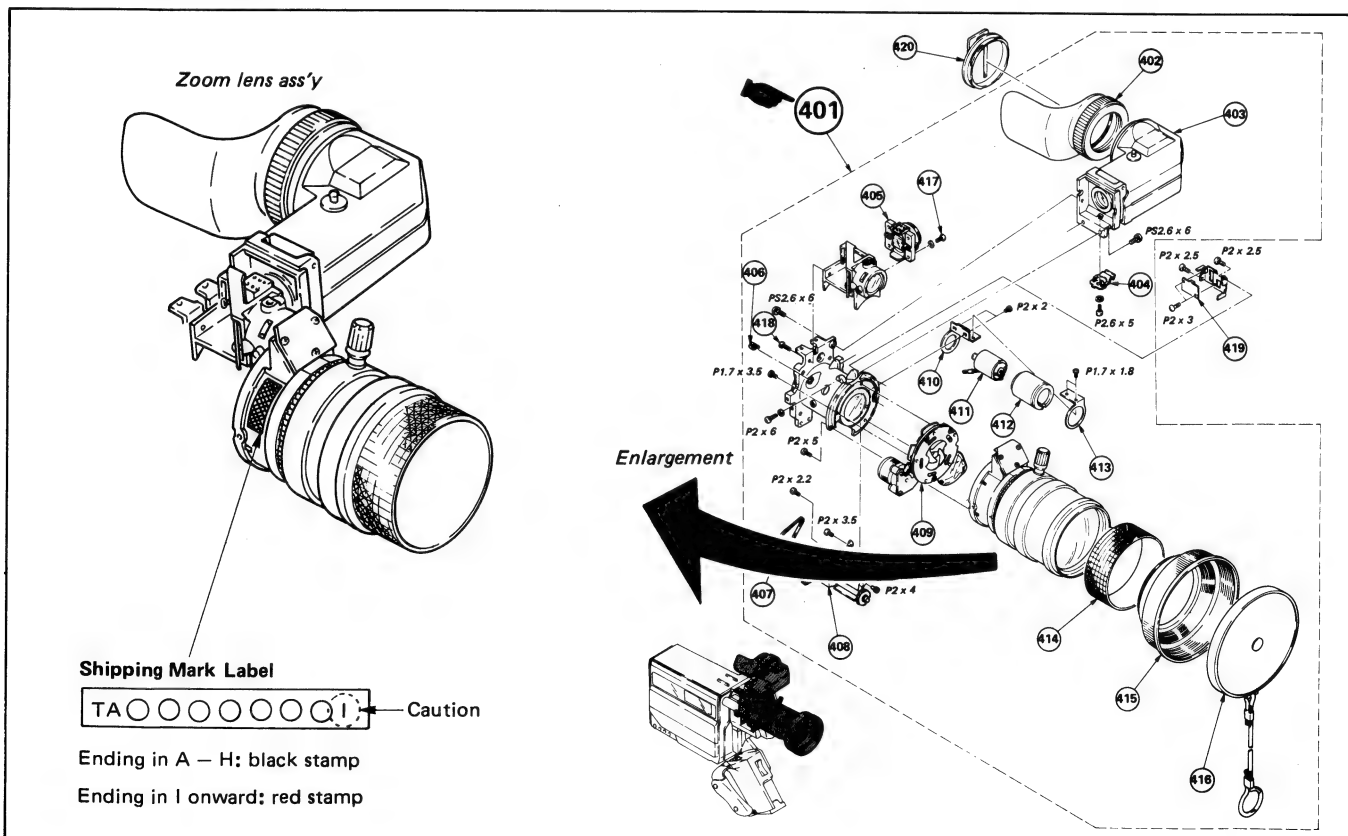


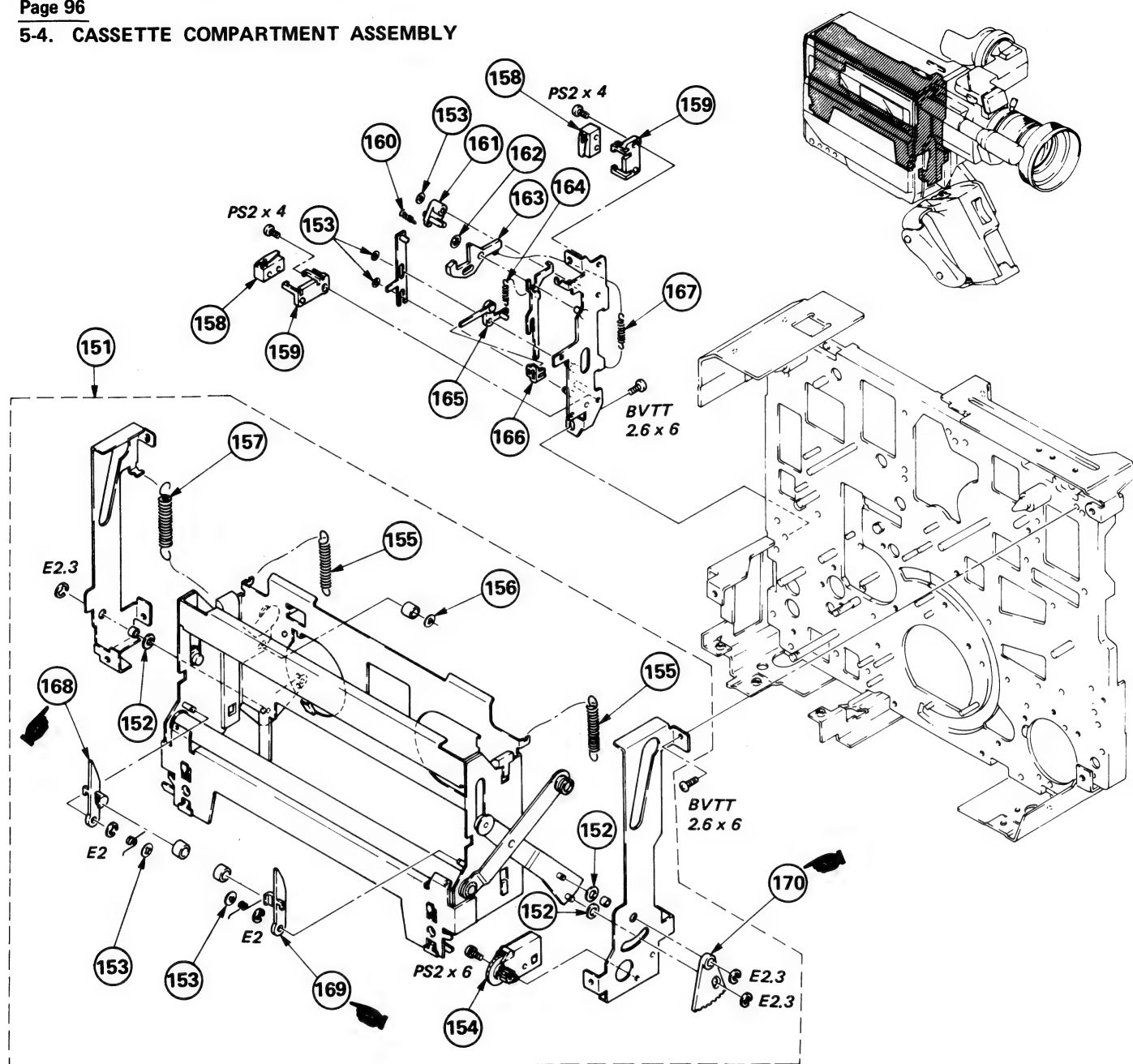
Fig. 2

No.	Part No.	Description	Remark
401	A-7613-052-B	Zoom lens VCL-906XA Ass'y	

(3) Addition and change of repair parts

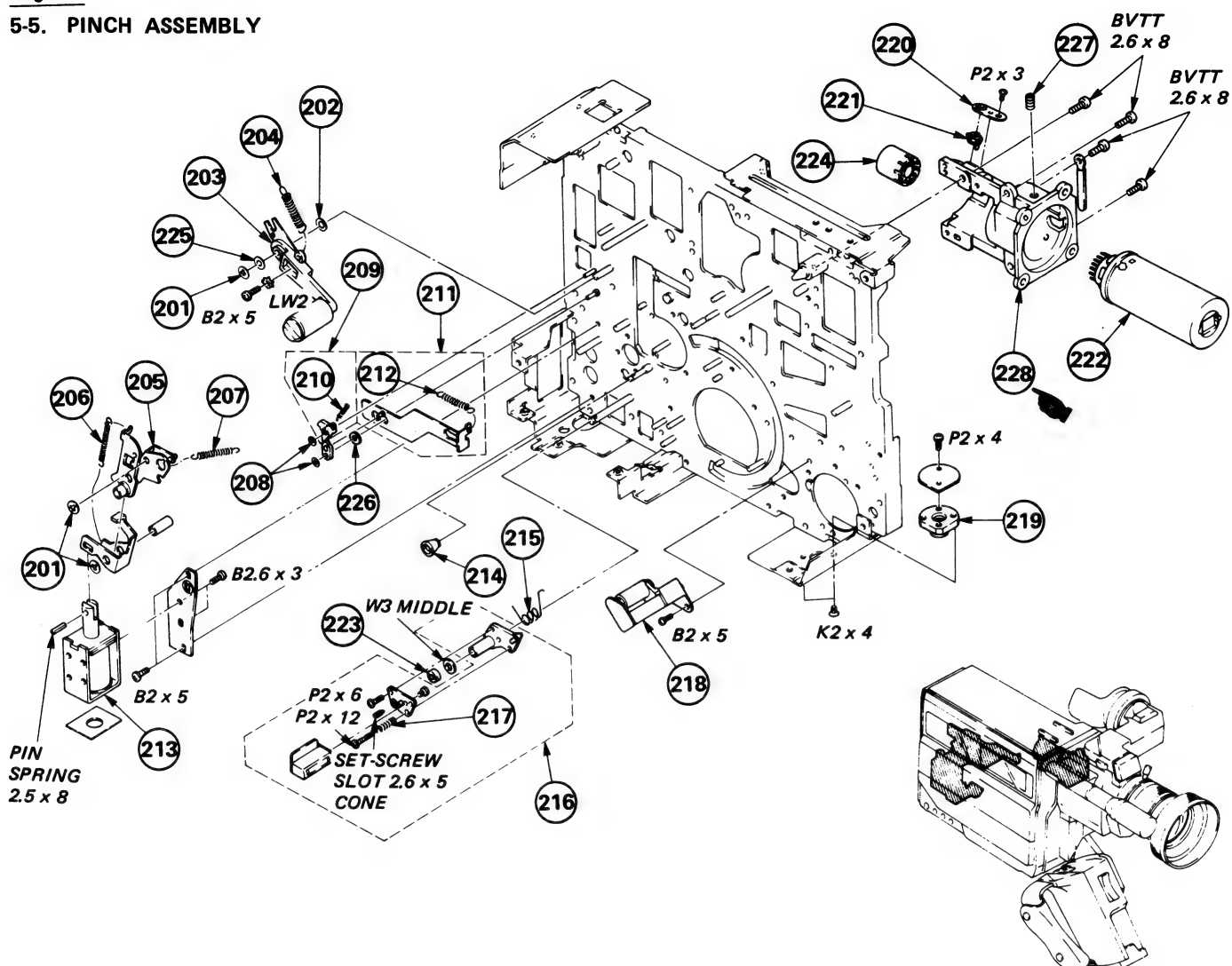
Page 96

5-4. CASSETTE COMPARTMENT ASSEMBLY



No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
151	▲:A-6751-176-A	CASSETTE COMPARTMENT ASSY	152-157 168-170	161	▲:3-681-539-00	LOCK, ARM	
152	3-678-822-00	SPACER		162	3-669-596-00	WASHER (2.3), STOPPER	
153	3-669-465-00	WASHER (1.5), STOPPER		163	▲:3-681-538-00	ARM, LOCK	
154	3-681-528-00	DAMPER		164	3-567-028-00	SPRING, TENSION	
155	3-143-067-00	SPRING, TENSION		165	▲:X-3681-417-0	DETECTION ASSY, LOCK	
156	3-669-595-00	WASHER (2), STOPPER		166	▲:3-681-588-00	STAY, DETECTION	
157	3-681-527-00	SPRING, TENSION		167	3-555-026-00	SPRING, TENSION	
158	1-554-582-00	SWITCH, MICRO S301 (CASSETTE IN) S302 (CASSETTE DOWN)		168	3-681-511-00	RETAINER (RIGHT) CASSETTE	
159	▲:3-681-587-00	TABLE, SWITCH		169	3-681-512-00	RETAINER (LEFT) CASSETTE	
160	3-561-627-00	SPRING, TENSION		170	3-681-525-00	GEAR	

5-5. PINCH ASSEMBLY

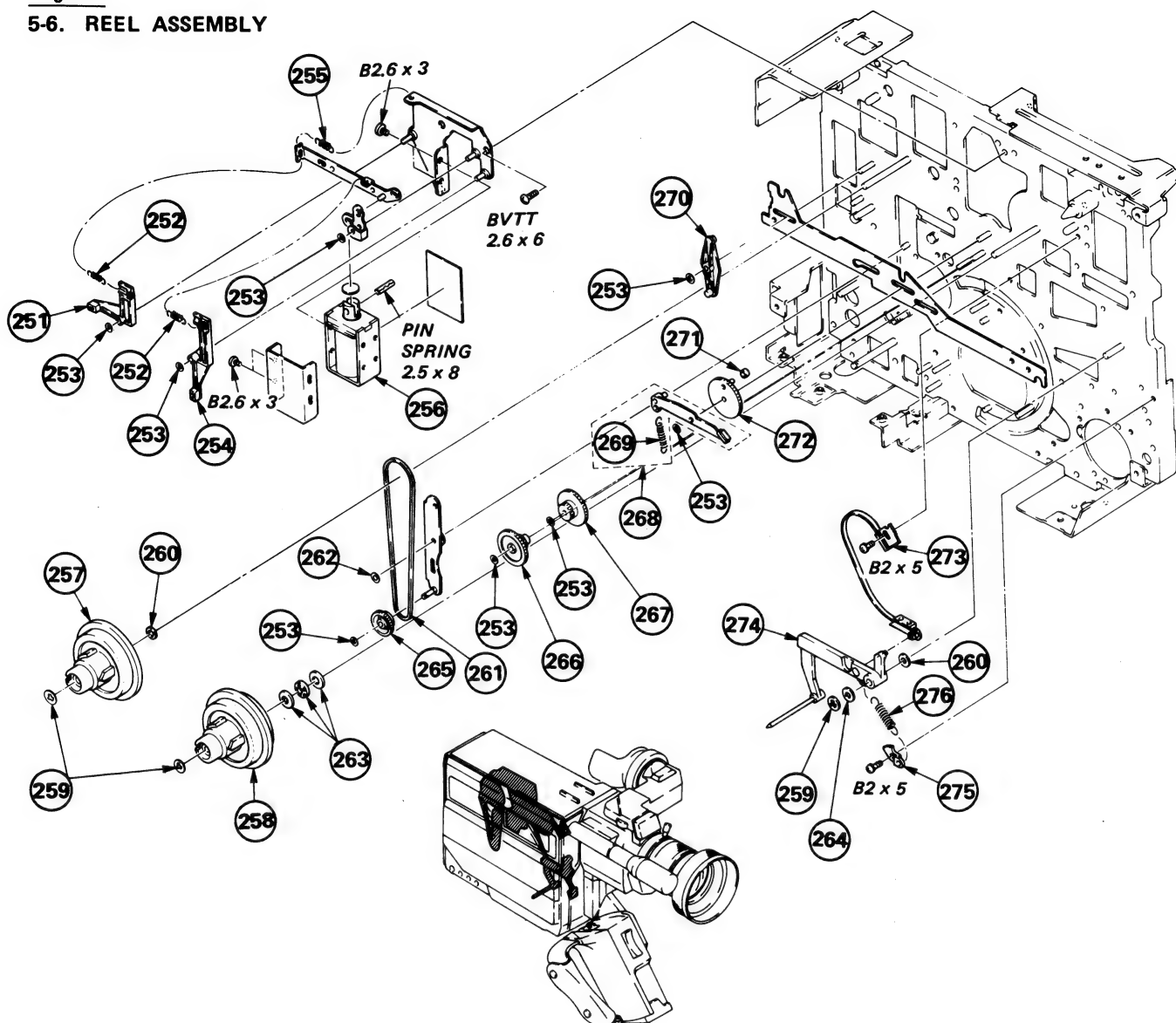


No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
201	3-669-596-00	WASHER (2.3), STOPPER		215	3-681-621-00	SPRING	
202	3-701-439-21	WASHER		216	A-6736-038-A	HEAD BLOCK ASSY, AC	217
203	A-6747-230-A	ARM BLOCK ASSY, PINCH	204	217	3-669-615-00	SPRING, COMPRESSION	
204	3-536-786-00	SPRING, TENSION		218	8-825-561-10	HEAD, ERAZE (EF254-21)	
205	▲:X-3681-406-0	LEVER ASSY, PINCH PRESS		219	3-681-547-00	BRACKET, TRIPOD	
206	3-681-452-00	SPRING, TENSION		220	▲:3-681-809-00	RETAINER, PIN, ADJUSTMENT	
207	3-578-397-00	SPRING, TENSION		221	3-681-808-00	PIN, ADJUSTMENT	
208	3-669-465-00	WASHER (1.5), STOPPER		222	8-701-032-29	CT-3222	
209	A-6747-235-A	LEVER (E) BLOCK ASSY, EJECT	210	223	3-669-318-00	NUT, ADJUSTMENT, GUIDE	
210	3-547-667-00	SPRING, TENSION		224	1-562-325-00	SOCKET ASSY, IMAGE PICKUP TUBE	
211	A-6747-234-A	LEVER (G) BLOCK ASSY, RELEASE	212	225	3-701-439-21	WASHER	
212	3-535-346-00	SPRING, TENSION		226	3-570-615-11	POLY-WASHER (DIA.1.2)	
213	▲ 1-454-357-21	SOLENOID, PLUNGER (PINCH) PM902		227	3-701-508-00	SET SCREW, DOUBLE POINT 3X6	
214	3-681-622-00	NUT, ADJUSTMENT, CTL HEAD		228	3-681-813-01	FRAME, LENS	

NOTE:

The components identified by shading and mark ▲ are critical for safety. Replace only with part number specified.

5-6. REEL ASSEMBLY

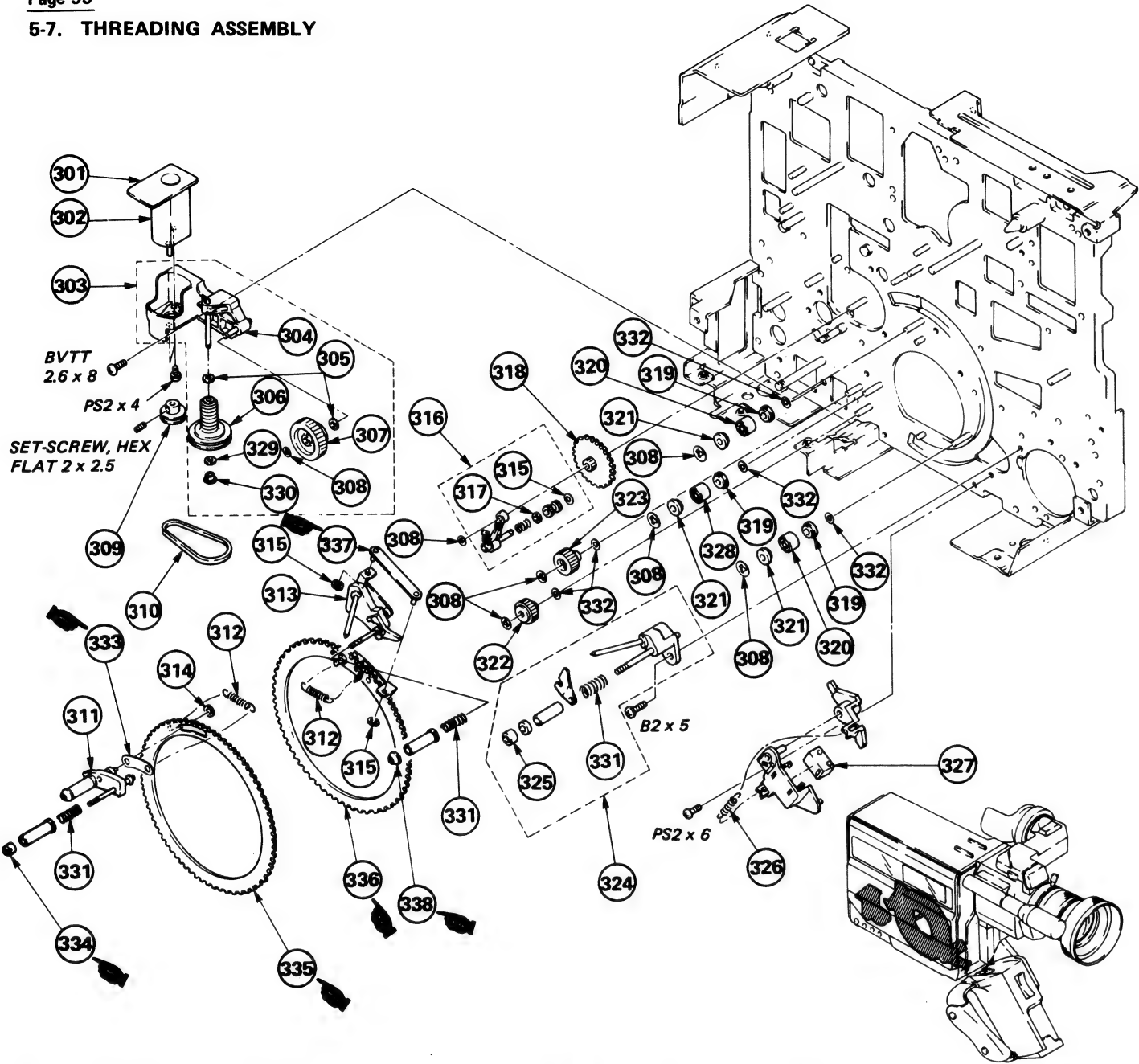


No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
251	A-6741-054-A	BRAKE ASSY, TAKE-UP		265	3-681-478-00	GEAR, FWD	
252	3-307-938-00	SPRING, TENSION		266	3-681-435-00	GEAR (B), DRIVING	
253	3-669-465-00	WASHER (1.5), STOPPER		267	3-681-434-00	GEAR (A), DRIVING	
254	A-6741-053-A	BRAKE ASSY, SUPPLY		268	A-6741-055-A	BRAKE ASSY, SOFT	269
255	3-527-025-00	SPRING, TENSION		269	3-672-461-00	SPRING, TENSION	
256	▲ 1-454-357-11	SOLENOID, PLUNGER (BRAKE) PM901		270	3-681-438-00	LEVER, PINCH CONVERSION	
257	X-3681-404-0	TABLE ASSY (TAKE-UP), REEL		271	3-681-443-00	ROLLER, DRIVING	
258	X-3681-405-0	TABLE ASSY (SUPPLY), REEL		272	3-681-436-00	GEAR (C), DRIVING	
259	3-669-596-00	WASHER (2.3), STOPPER		273	X-3681-410-0	BAND ASSY, TENSION REGULATOR	
260	3-701-439-21	WASHER		274	▲ X-3681-402-0	ARM ASSY, TENSION REGULATOR	
261	3-681-447-00	BELT, FWD		275	3-681-439-00	RETAINER, SPRING	
262	3-570-615-00	POLY-WASHER (DIA.1.2)		276	3-536-767-XX	SPRING, TENSION	
263	3-681-449-00	BEARING, THRUST					
264	3-701-439-21	WASHER					

NOTE:

The components identified by shading and mark ▲ are critical for safety. Replace only with part number specified.

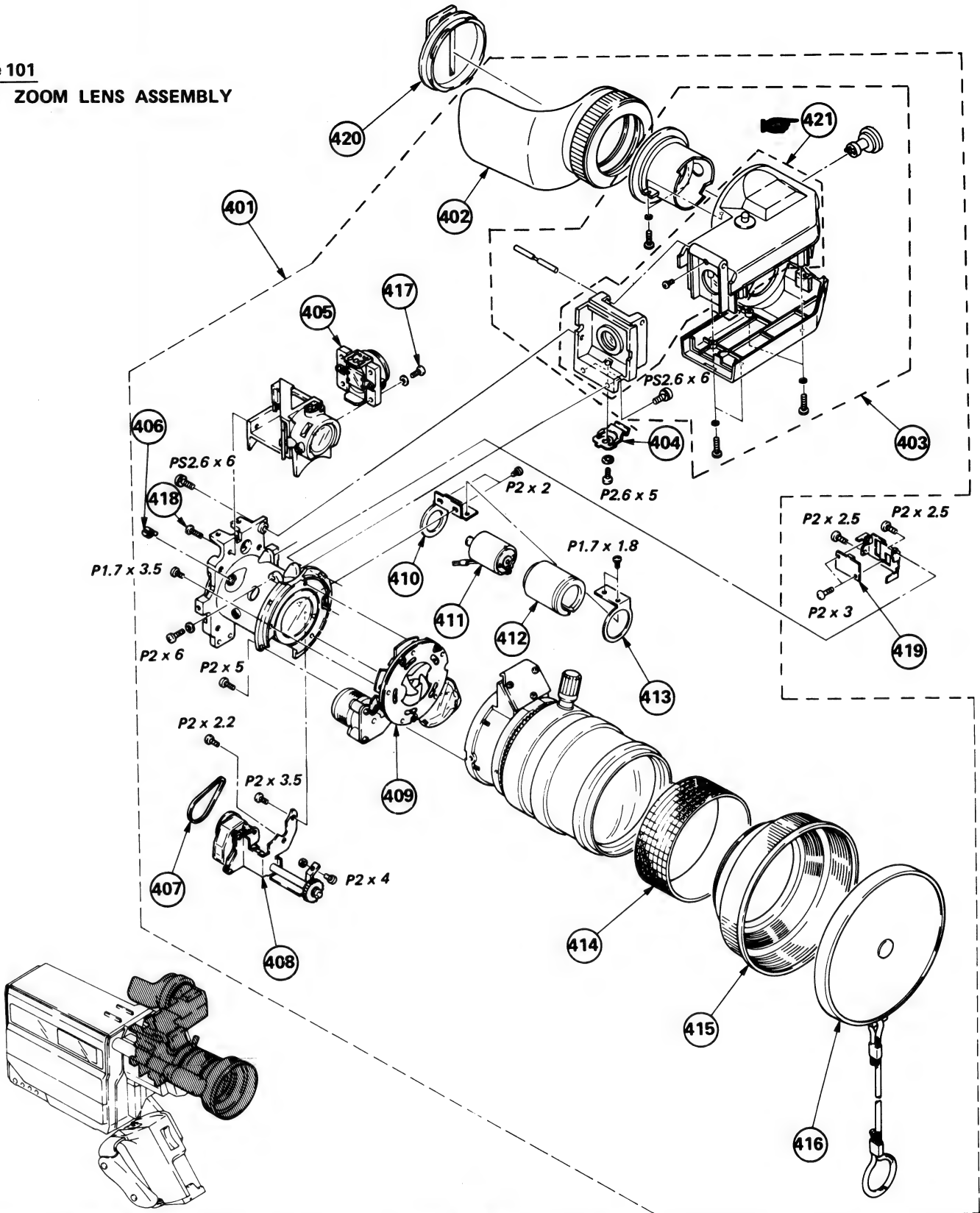
5-7. THREADING ASSEMBLY



No.	Part No.	Description	Remark
301	▲:1-609-855-00	LM-12 BOARD	
302	8-835-098-01	MOTOR, DC (DNR-660QA) M901(LOADING)	
303	▲:A-6737-126-A	CASE BLOCK ASSY, MOTOR	304,305,306,307,308,329,330
304	X-3681-430-0	CASE ASSY, MOTOR	
305	3-701-437-21	WASHER	
306	X-3681-429-0	GEAR ASSY, WORM	
307	3-681-422-00	WHEEL, WORM	
308	3-669-465-00	WASHER (1.5), STOPPER	
309	3-681-423-00	PULLEY, MOTOR, LOADING	
310	3-681-424-00	BELT, LOADING	
311	A-6750-151-A	BASE BLOCK ASSY, TG5	331
312	3-564-935-00	SPRING, TENSION	
313	A-6746-033-A	BASE BLOCK ASSY, TG4	331
314	3-681-678-00	WASHER, STOPPER	
315	3-570-615-00	POLY-WASHER (DIA.1.2)	
316	A-6747-233-A	ARM ASSY, EG	315,317
317	3-701-436-01	WASHER, 1.6	
318	3-681-437-00	GEAR (A), EJECT	
319	3-681-433-00	ROLLER (C), RING GUIDE	

No.	Part No.	Description	Remark
320	3-681-429-00	ROLLER (B), RING GUIDE	
321	3-681-428-00	ROLLER (A), RING GUIDE	
322	3-681-430-00	GEAR (S), LOADING	
323	3-681-431-00	GEAR (T), LOADING	
324	▲:A-6746-032-A	BASE BLOCK ASSY, TG1	325,331
325	3-669-446-00	NUT, GUIDE, NO. 6	
326	3-307-938-00	SPRING, TENSION	
327	1-554-581-00	SWITCH, MICRO (LOADING END) S303	
328	3-681-674-00	ROLLER (D), GUIDE, RING	
329	3-701-437-01	WASHER	
330	3-703-075-00	CAP 2, SHAFT	
331	3-669-666-00	SPRING, COMPRESSION	
332	3-701-437-11	WASHER	
333	3-681-419-01	POLY-SLIDER, TG5 BASE	
334	3-681-404-01	FLANGE (UPPER), TG4	
335	3-681-418-01	RING (T), LOADING	
336	X-3681-431-1	RING (S) ASSY, THREADING	
337	X-3681-432-1	JOINT (B) ASSY, TG4 BASE	
338	3-681-410-01	NUT, TG6	

5-9. ZOOM LENS ASSEMBLY



No.	Part No.	Description	Remark
401	A-7613-052-B	LENS (VCL-906XA) ASSY, ZOOM	402-418,421
402	3-706-869-00	CUP, EYE	
403	3-706-868-00	EYEPiece ASSY	
404	▲:3-706-870-00	CLAW, ROCK	421
405	3-706-871-00	SCREEN ASSY, LED	
406	3-706-859-00	ADJUSTMENT PIECE, BF	
407	3-706-860-00	BELT, Z	
408	3-706-864-00	GEAR ASSY, ZOOM	
409	3-706-858-00	FILTER ASSY, IRIS	
410	▲:3-706-862-00	BRACKET A, Z MOTOR	
411	3-706-865-00	MOTOR ASSY, ZOOM	

No.	Part No.	Description	Remark
412	3-706-861-00	RUBBER, VIBRATION PROOF	
413	▲:3-706-863-00	BRACKET B, Z MOTOR	
414	3-706-857-00	KNURL, FOCUS RUBBER	
415	3-706-855-00	HOOD	
416	3-706-856-00	CAP, HOOD	
417	3-681-824-11	SCREW +P2X6	
418	3-681-824-01	SCREW +P2X5	
419	▲:1-610-553-00	FL-1 BOARD	
420	3-681-823-00	COVER, EYECUP	
421	A-7613-054-A	UPPER FINDER CASE ASSY, KIT	

(4) There were some mistakes in the names of the semiconductor products. Please correct.

PA-1 BOARD

Page	CORRECT			INCORRECT		
	<u>Ref.No.</u> <u>Part No.</u>	<u>Description</u>	<u>Remark</u>	<u>Ref.No.</u> <u>Part No.</u>	<u>Description</u>	<u>Remark</u>
104	Q807 8-729-100-66	TRANSISTOR 2SC1623		Q807 8-729-102-66	TRANSISTOR 2SC1623	
	Q808 8-729-100-66	TRANSISTOR 2SC1623		Q808 8-729-102-66	TRANSISTOR 2SC1623	

VC-2 BOARD

Page	CORRECT				INCORRECT			
	Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
106	D152	8-719-911-19	DIODE 1SS119		D152	8-719-921-20	DIODE 1SS119TD	
	D503	8-719-911-19	DIODE 1SS119		D503	8-719-921-20	DIODE 1SS119TD	
107	D511	8-719-911-19	DIODE 1SS119		D511	8-719-921-20	DIODE 1SS119TD	
	D515	8-719-911-19	DIODE 1SS119		D515	8-719-921-20	DIODE 1SS119TD	
	D518	8-719-911-19	DIODE 1SS119		D518	8-719-921-20	DIODE 1SS119TD	
	D701	8-719-911-19	DIODE 1SS119		D701	8-719-921-20	DIODE 1SS119TD	
	D704	8-719-911-19	DIODE 1SS119		D704	8-719-921-20	DIODE 1SS119TD	
	D705	8-719-911-19	DIODE 1SS119		D705	8-719-921-20	DIODE 1SS119TD	
108	Q515	8-729-100-76	TRANSISTOR 2SA812		Q515	8-729-102-76	TRANSISTOR 2SA812-T2M6	
	Q529	8-729-100-66	TRANSISTOR 2SC1623		Q529	8-729-102-26	TRANSISTOR 2SC1623-T2L6	
	Q531	8-729-100-66	TRANSISTOR 2SC1623		Q531	8-729-102-26	TRANSISTOR 2SC1623-T2L6	
	Q652	8-729-202-72	TRANSISTOR 2SC3381		Q652	8-729-202-57	TRANSISTOR 2SC3381	

BMC-100P/100PK

ADJUSTMENT MANUAL



AEP Model
(BMC-100P)

UK Model
(BMC-100PK)

E Model
(BMC-100PK)

December, 1983

Betamovie
SB CHASSIS

File this Adjustment Manual with the Service Manual.



Beta
B BETAMOVIE
SONY®

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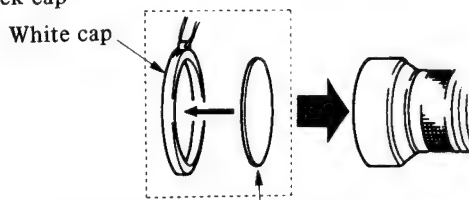
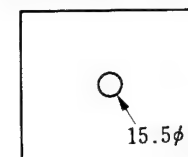
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SECTION 1

PREPARATION BEFORE ADJUSTMENT (CAMERA SECTION)

1-1. LIST OF SERVICING JIGS

Oscilloscope; digital electronic voltmeter (4 digits); AC adapter; adjusting screwdriver; L-wrench; level; special purpose color monitor.

Ref No.	Name	Part code	Use
J 1	Jig for oscillating 5.4MHz Note: To be remodeled from a 4.5MHz oscillator jig.	J-6023-420-A ※ Crystal replacement	H size adjustment
	Part required for remodeling: (5.4MHz crystal)	J-6080-809-A	
J 2	Red filter	J-6080-059-A	Focus adjustment, HV phase correction adjustment
J 3	ND filter 0.4	J-6080-806-A	×2 beam adjustment, LLA adjustment
	ND filter 0.1	J-6080-807-A	LLA adjustment
	ND filter 1.0	J-6080-808-A	LLA adjustment
J 4	Pattern box PTB-100 (For 90-130V ac) PTB-200 (For 190-240V ac)	J-6020-490-A J-6020-680-A	
J 5	Color chart	J-6020-250-A	
J 6	Signal converter BMCJ-888P	J-6080-820-A	×2 beam adjustment, ×5 beam adjustment, H size adjustment, flange back adjustment, V size adjustment, V centering adjustment
J 7	2.2Ω standard resistor	J-6080-812-A	Heater constant current adjustment
<p>The following jigs must be produced:</p> <p>(1) Black cap</p>  <p>(2) High brightness pattern</p> <p>Bond a sheet of black paper to a cardboard and make a hole 15.5mm in diameter at the center of the paper.</p> 			<p>H balance adjustment, V balance adjustment, bias light adjustment, H size adjustment, dark adjustment, AGC weighting adjustment, iris weighting adjustment, burst level adjustment, carrier balance adjustment</p> <p>×2 beam adjustment, ×5 beam adjustment, knee adjustment</p>

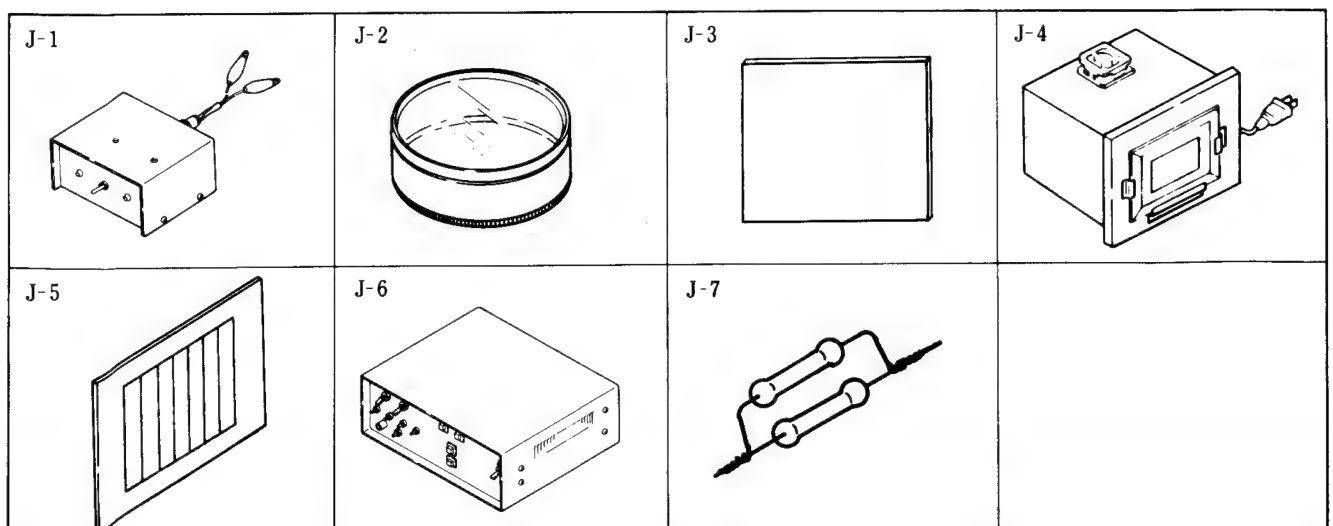


Fig. 1-1

1-2. PREPARATION

- 1) Set filter selector to ☼ (indoor).
- 2) Also perform the white balance if there are no special notes ("W" is to be turned off).

1-3. CONNECTION DIAGRAM

- 1) Set up pattern box and Betamovie as shown below.
- 2) Level the Betamovie and the pattern box, and place them in same height.

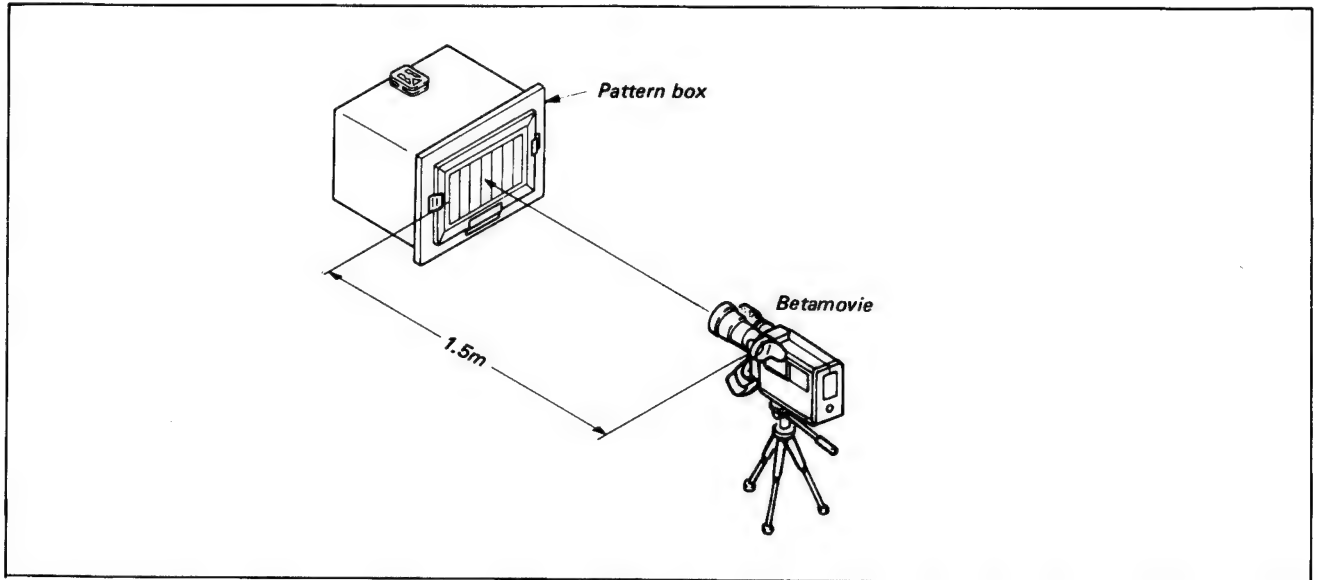


Fig. 1-2

- 3) Connect Betamovie, signal converter BMCJ-888P and special purpose monitor together as shown below.

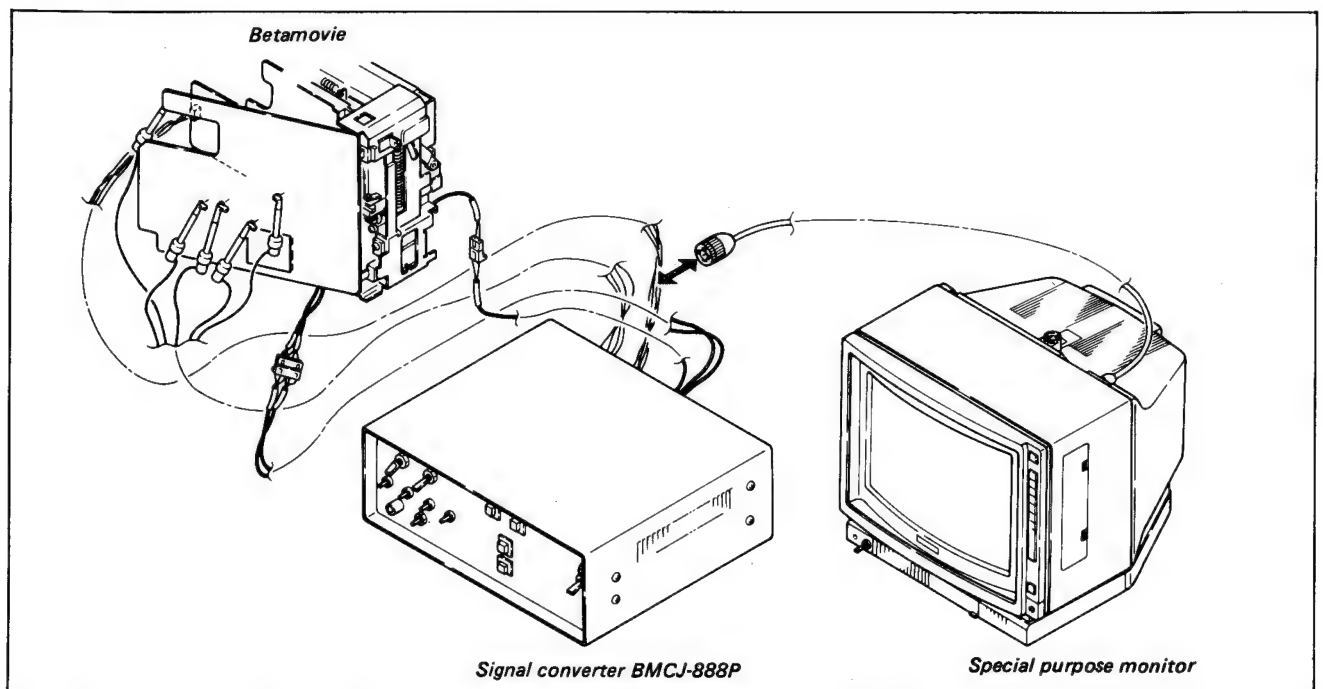


Fig. 1-3

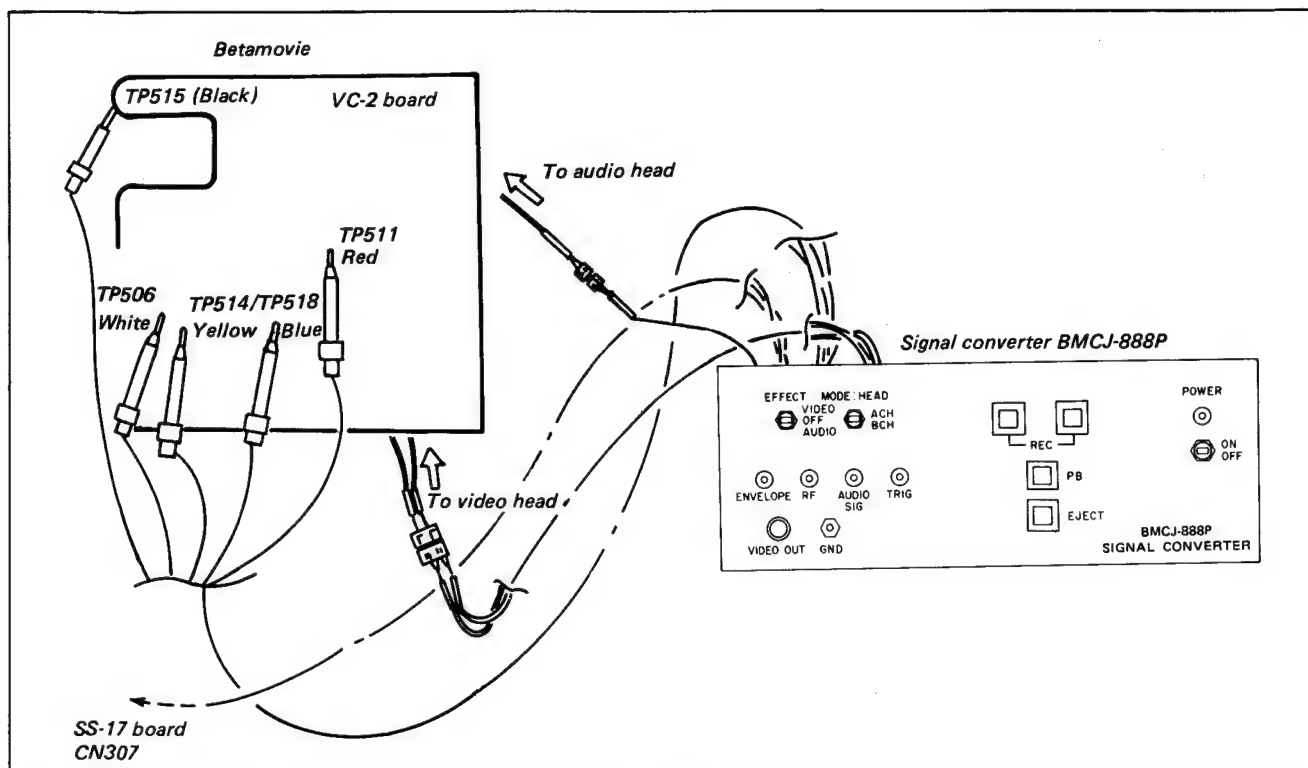


Fig. 1-4

1-4. EYESIGHT ADJUSTMENT

Adjusting Procedure:

- 1) Direct camera toward a bright, plain object such as white paper.
- 2) Turn the eyesight adjusting knob so as to make finder frame clearly recognizable.

1-5. PROCEDURE FOR DETERMINING MONITOR CENTER (RASTER CENTER) OF SPECIAL PURPOSE MONITOR FOR BETAMOVIE

This is required for "OVF and optical axis confirmation" and "V centering adjustment".

Note: Use a normal set for the determination.

Oscilloscope: TP506

Object: High brightness pattern

Zoom lever: 30 mm

- 1) Oscilloscope TIME/DIV: 20 μ sec (H)
Adjust universal head to the left or right so as to position the spot portion to the center.
- 2) Oscilloscope TIME/DIV: 5msec (V)
Adjust universal head upward or downward so as to position the spot portion to the center.

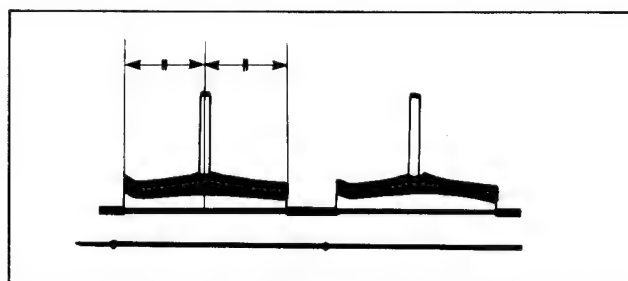


Fig. 1-6

- 3) Use the center of spot displayed on the monitor screen as monitor center. (Show a mark on the monitor center')

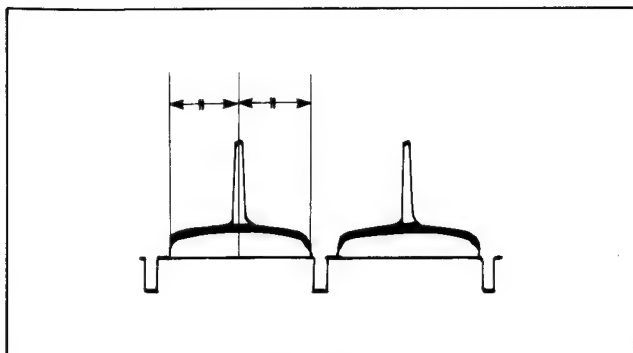


Fig. 1-5

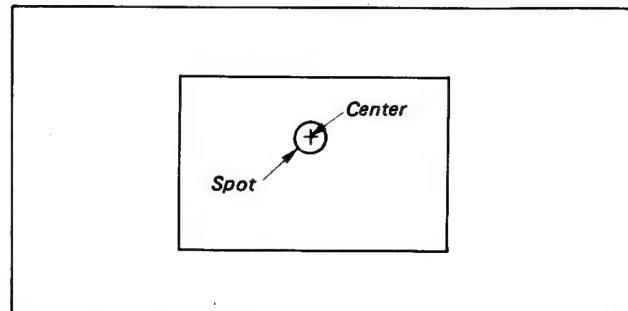


Fig. 1-7

1-6. PRECAUTIONS

(1)

Be sure to take the following precautions before starting adjustment:

- 1) SMF Trinicon tube may be easily burned if there is incident light before a rise of beam. Therefore, be sure to prohibit the entry of light in lens before beam adjustment. (Do not direct camera to a light source.)
- 2) Adjust color pattern by fully aligning to the bottom side. (If this is not performed, the weighting circuit begins to operate and normal iris and AGC operation will not occur.)

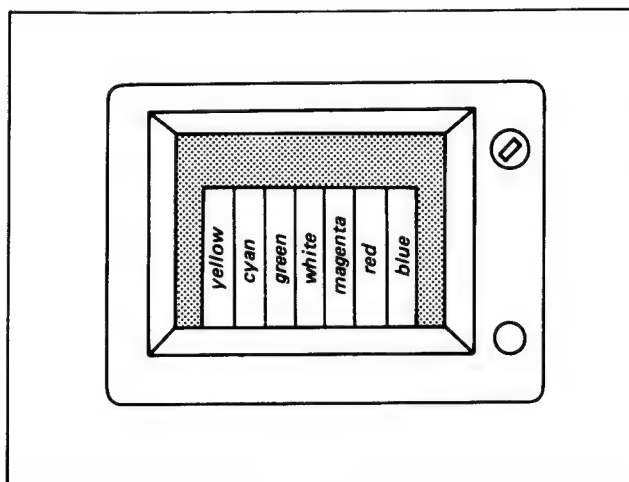


Fig. 1-8

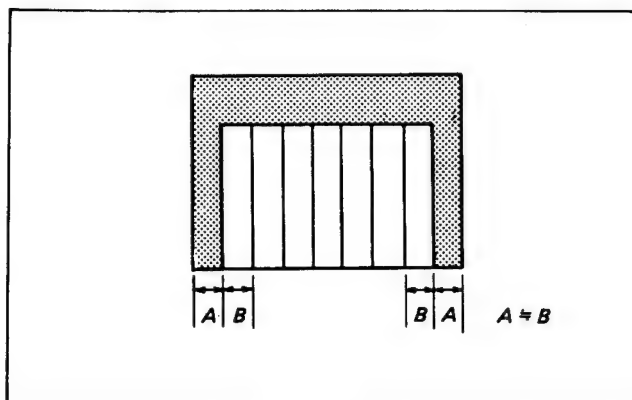


Fig. 1-9

(2) VC-2 board

High voltage is applied to the hatched portion. Your may have an electric shock if you touch this portion.

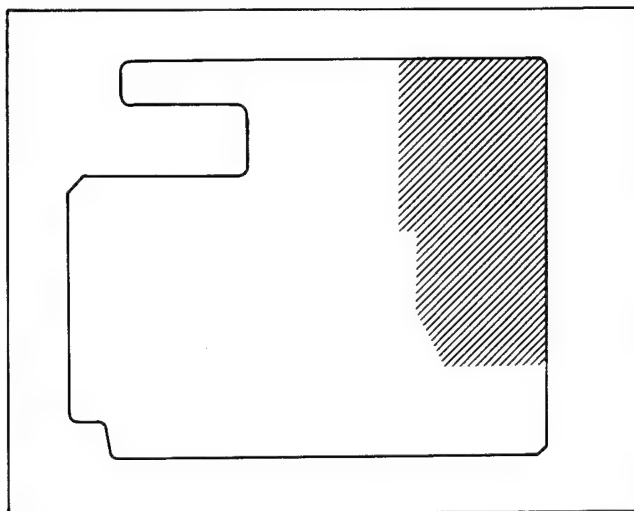
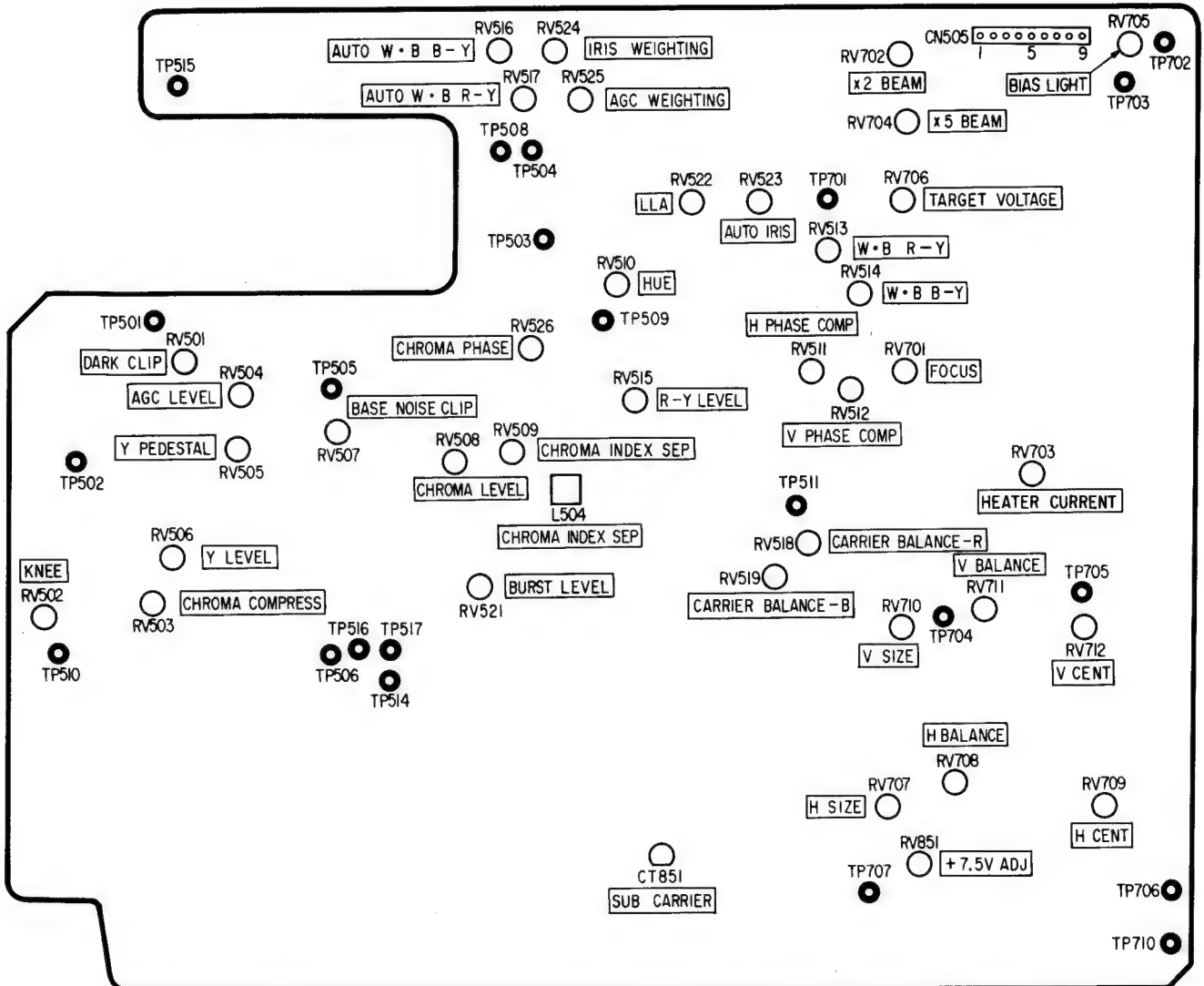


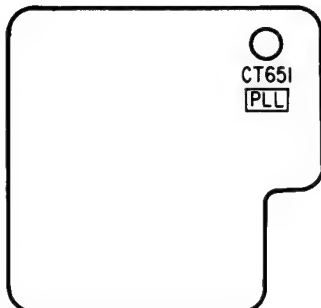
Fig. 1-10

1-7. RV AND TP LOCATION

VC-2 board (printed face side)



GC-3 board (printed face side)



SECTION 2 ADJUSTMENTS (CAMERA SECTION)

2-1. ADJUSTMENT OF 7.5V POWER SUPPLY AND HEATER

2-1-1. Adjustment of +7.5V Power Supply Voltage

Adjusting Procedure:

- 1) Cover lens with a black cap.
- 2) Connect \oplus probe of digital voltmeter to TP706 (7.5V line) and \ominus probe to TP710.
- 3) Turn RV851 so as to adjust the voltage at that time to $7.54V \pm 0.075V$.

Adjusted value: $7.54V \pm 0.075V$

2-1-2. Adjustment of Constant Current of Heater

Note: This adjustment should be performed only when the following parts were replaced or adjusted:

(Replacement of HV701, adjustment of RV851, replacement of R730, R762, R763, RV703)

* Only the confirmation is necessary when replacing trinitron tube.

Adjusting Procedure:

- 1) Remove the socket of trinitron tube.
- 2) Attach 2.2Ω standard resistor and digital voltmeter as shown below.
- 3) Turn RV703 so as to adjust the voltage to $682 \pm 6mV$.

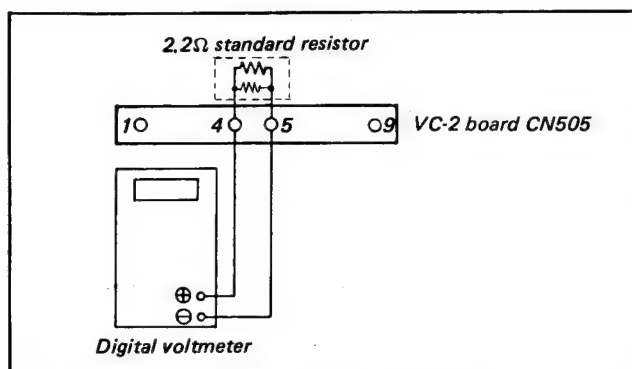


Fig. 2-1

2-2. ADJUSTMENT OF DEFLECTION SYSTEM

2-2-1. H Balance Adjustment

Oscilloscope: CH-1: TP702 } ADD mode
CH-2: TP703 } **Note:** Oscilloscope range 2V/DIV

Adjusting Procedure:

- 1) Cover lens with a black cap.
- 2) Turn and adjust RV708 so as to make the waveform parabolic as shown below.

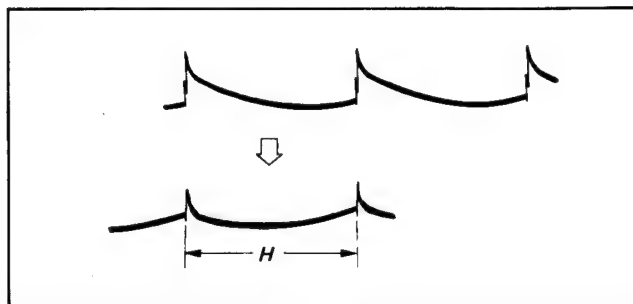


Fig. 2-2

2-2-2. Adjustment of V Balance

Oscilloscope: CH-1: TP704 } ADD mode
CH-2: TP705 } **Note:** Oscilloscope range 2V/DIV

Adjusting Procedure:

Turn and adjust RV711 so as to make the waveform straight as shown below.

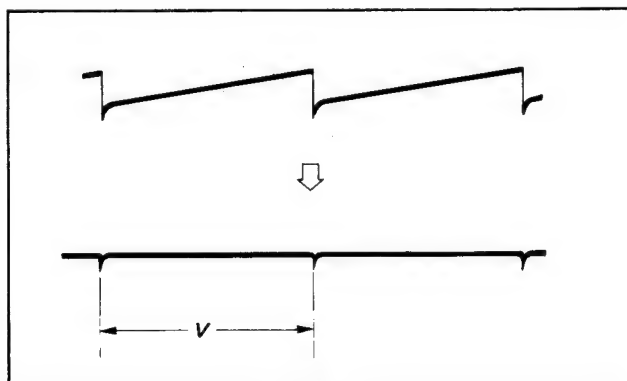


Fig. 2-3

2-2-3. Target Voltage Adjustment

Adjusting Procedure:

- 1) Connect \oplus probe of digital voltmeter to TP701 and \ominus probe to TP515 respectively.
- 2) Turn RV706 and adjust voltage to $49 \pm 2V$.

Note: Turn RV706 little by little clockwise starting from its utmost end on the printed face of the board.

2-2-4. Bias Light Adjustment

Oscilloscope: TP501

Adjusting Procedure:

- 1) Cover lens with a black cap.
- 2) Adjust the level to $20 \pm 8\text{mVp-p}$ using RV705 as shown below.

Note: Temporarily adjust beam prior to the bias light adjustment.

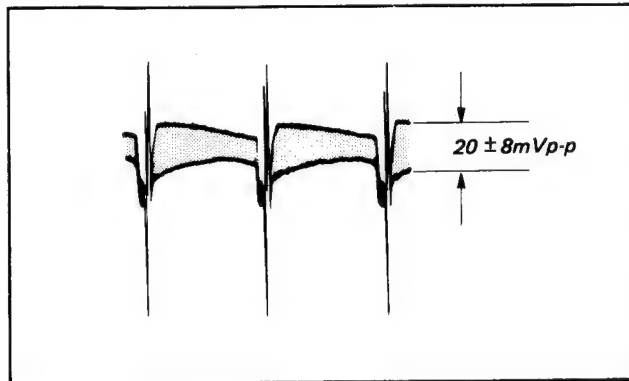
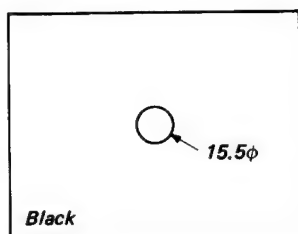


Fig. 2-4

2-2-5. x2 Beam Adjustment

Oscilloscope: TP501

Object to be shot: High brightness pattern (shown below).



Adjusting Procedure:

- 1) Turn RV702 fully counterclockwise and RV704 fully clockwise on the printed face.
- 2) Cover lens with ND-0.4 filter.
- 3) Set zoom lever to the utmost telephoto end.
- 4) Adjust output waveform to $480 \pm 50\text{mV}$ using RV702.

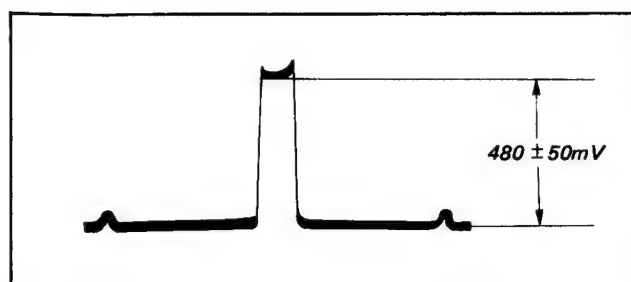
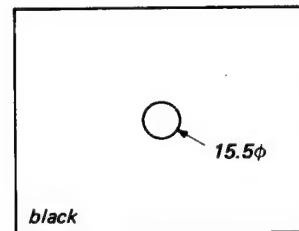


Fig. 2-5

2-2-6. x5 Beam Adjustment (ABO)

Oscilloscope: TP501

Object to be shot: High brightness pattern (shown below).



Adjusting Procedure:

- 1) Set zoom lever to the utmost telephoto end.
- 2) Turn RV704 counterclockwise on the printed face and adjust the peak-to-peak value of the waveform shown in Fig. 2-6 to $1.2 \pm 0.1\text{Vp-p}$.

Note: Make this adjustment more than 1 minute after turning power on.

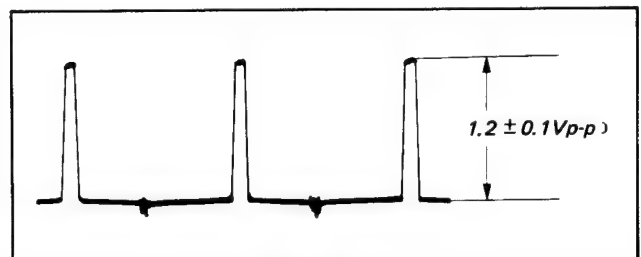


Fig. 2-6

2-2-7. Focus Adjustment

Oscilloscope: TP501

Object to be shot: Fully white pattern

Adjusting Procedure:

- 1) After shooting the white pattern fully on the picture frame, cover the lens with a red filter.
- 2) Turn RV701 so as to make the carrier component of the waveform shown below maximum.

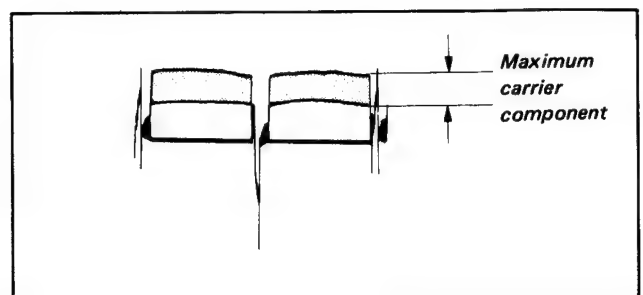


Fig. 2-7

2-2-8. H Size Adjustment

Connect 5.4MHz oscillator jig as shown below.

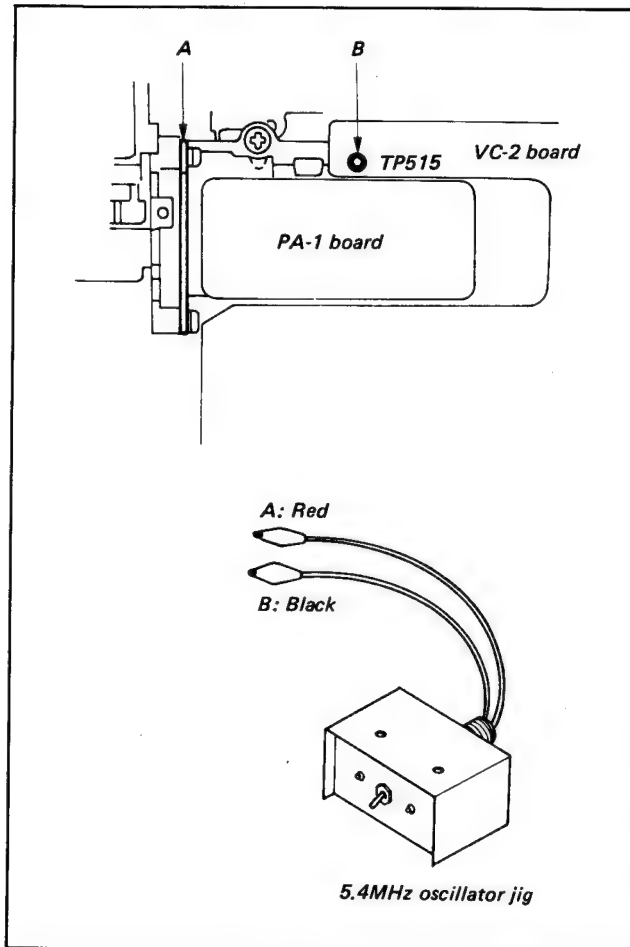


Fig. 2-8

Adjusting Procedure:

- 1) Cover the lens with a white cap.
- 2) While observing the color monitor, adjust RV707 so as to make the number of beats the smallest laterally as shown below, and confirm that the number of beats is less than 6.7.

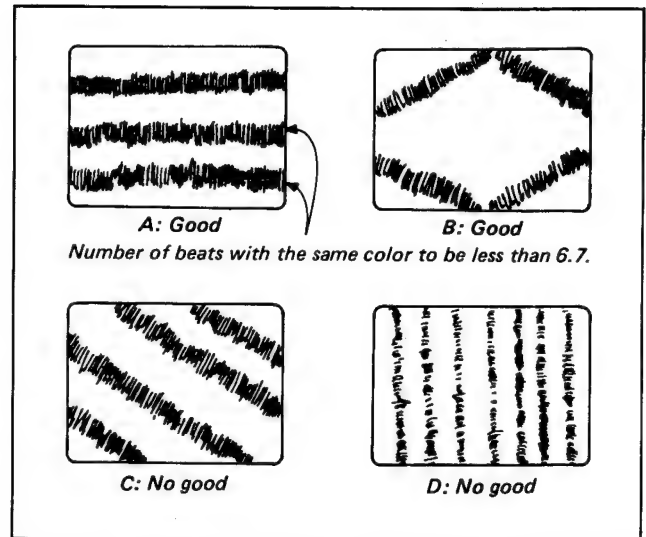


Fig. 2-9

2-2-9. H Centering Adjustment

Oscilloscope: CH-1: TP501
CH-2: TP511

Object to be shot: Fully white pattern

Adjusting Procedure:

Turn RV-709 fully counterclockwise first on the pattern face and then gradually turn it clockwise so as to make the width of black mask of waveform shown in Fig. 2-10 equal to $2.9 \pm 0.4 \mu\text{sec}$ from the rise of HD pulse shown below.

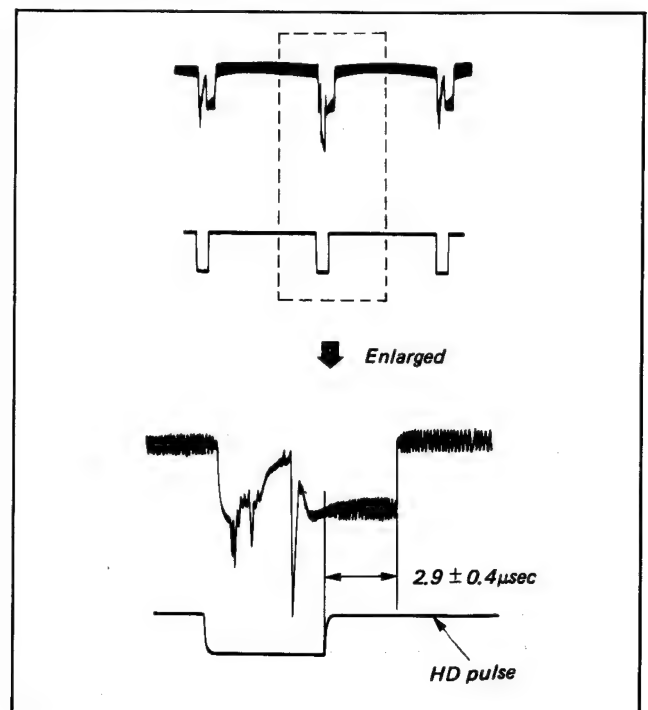


Fig. 2-10

2-2-10. Adjustment of Levelness

- 1) Place the camera and object in level, and focus the lens on the object.

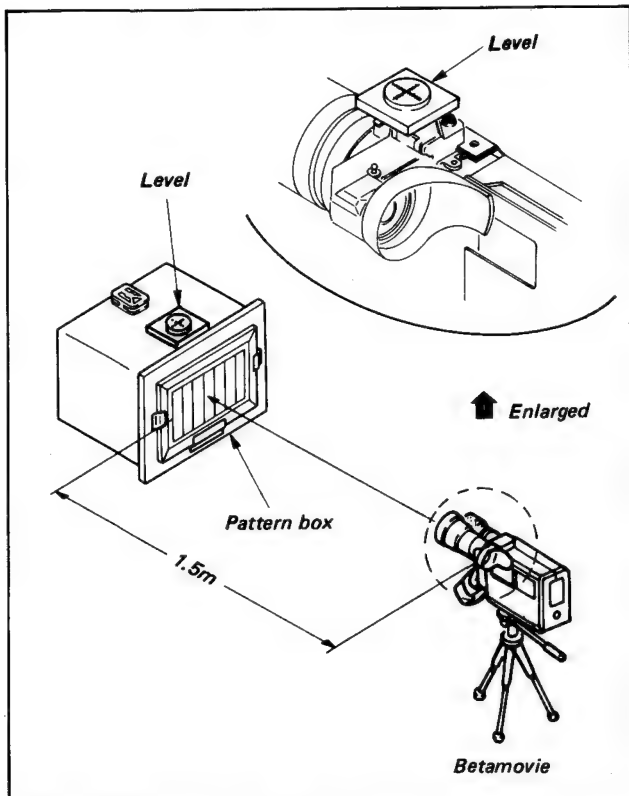


Fig. 2-11

- 2) Loosen the clamp screw of Trinicon tube with a hexagon key wrench, and turn level adjusting pin with a regular screwdriver so as to make the Trinicon tube level.

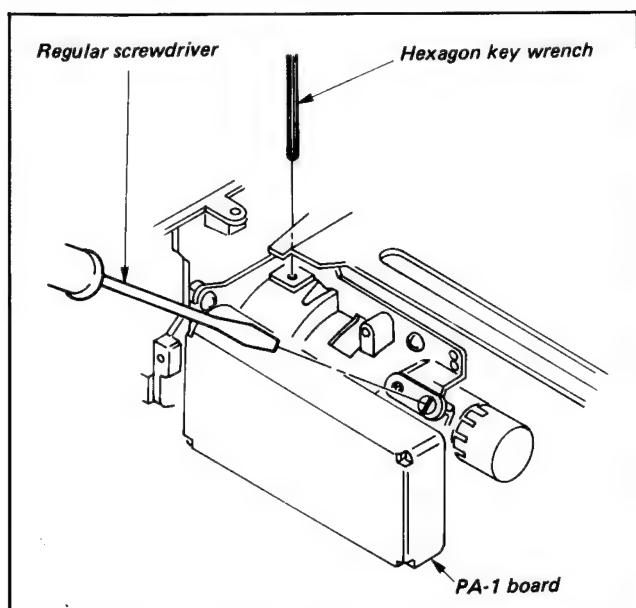


Fig. 2-12

2-2-11. Flange Back Adjustment (F. B.)

Adjusting Procedure:

- 1) Set the focus ring of lens to 1.5m.
- 2) Set zoom ring to a wide angle end of 9mm.
- 3) Loosen lens lock screw A.
- 4) Slightly rotate lens with a screwdriver having a narrow blade from C-portion.
- 5) Adjust the adjust screw of B-portion so as to make the clearest at the center of monitor.
- 6) Tighten the lens lock screw A.
- 7) When the focus ring is rotated to make the center the clearest, the position of the focus ring must be within the standard range.
- 8) If the step 7 fails, repeat steps 3 to 6.

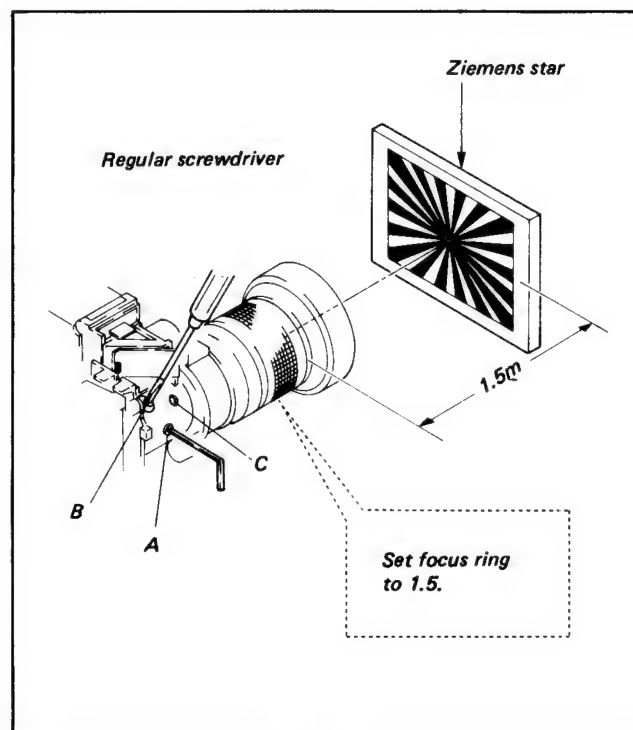


Fig. 2-13

Note: Start adjustment only after moving the zoom lever back and forth more than once between wide angle end and telephoto end.

Standard range of step 7: 1.2 | 1.5 | 2

2-2-12. Confirmation of Horizontal Optical Axis with OVF

Object to be shot: Color pattern

Adjusting Procedure:

- 1) Set the zoom lever to the telephoto end.
- 2) Adjust the universal head so as to align the pattern box center with monitor center.
- 3) Adjust the adjust screw so as to align the finder with pattern box center.

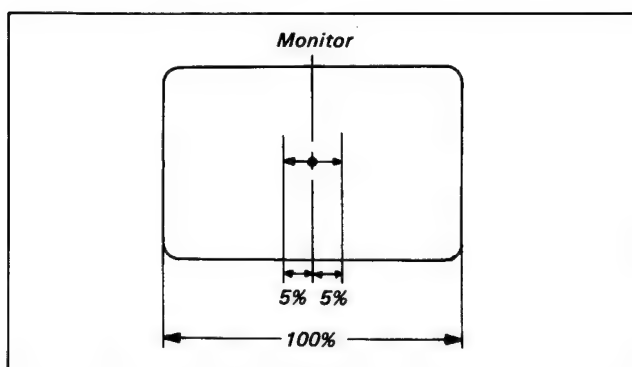


Fig. 2-14

Standard:

When the finder center is aligned with pattern box center, the deviation on the monitor must be within $\pm 5\%$.

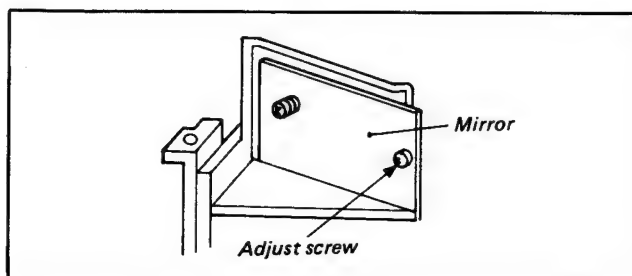


Fig. 2-15

2-2-13. V Size Adjustment

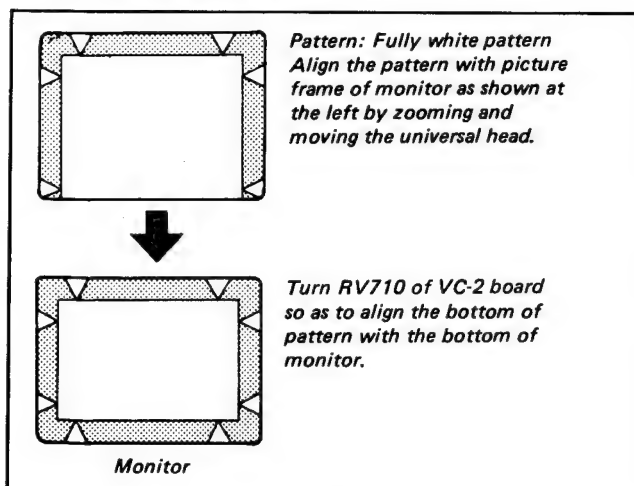


Fig. 2-16

2-2-14. Adjustment of V Centering

Show marks to the centers of white pattern and monitor screen. Set the zoom lever to telephoto and focus the lens.

Adjusting Procedure:

- 1) Align the center of pattern with the center of lens by moving the universal head, set the zoom to wide angle, and align the center of screen to the center of white pattern.
- 2) If the center of screen is deviated from the center of white pattern after setting the zoom to telephoto, then deviate the center of fully white pattern by one-fifth of center-to-center distance A in the direction of deviation by adjusting RV712.
- 3) After setting the zoom to wide angle, align the center of fully white pattern with the center of lens by moving the universal head, and align the center of the pattern with the center of screen.
- 4) Set the zoom to telephoto, and confirm that the deviation between the center of screen and the center of white pattern is less than $1/25$ of screen length ℓ .

Note: If the deviation is not less than $1/25$ of ℓ , then repeat the adjustment again.

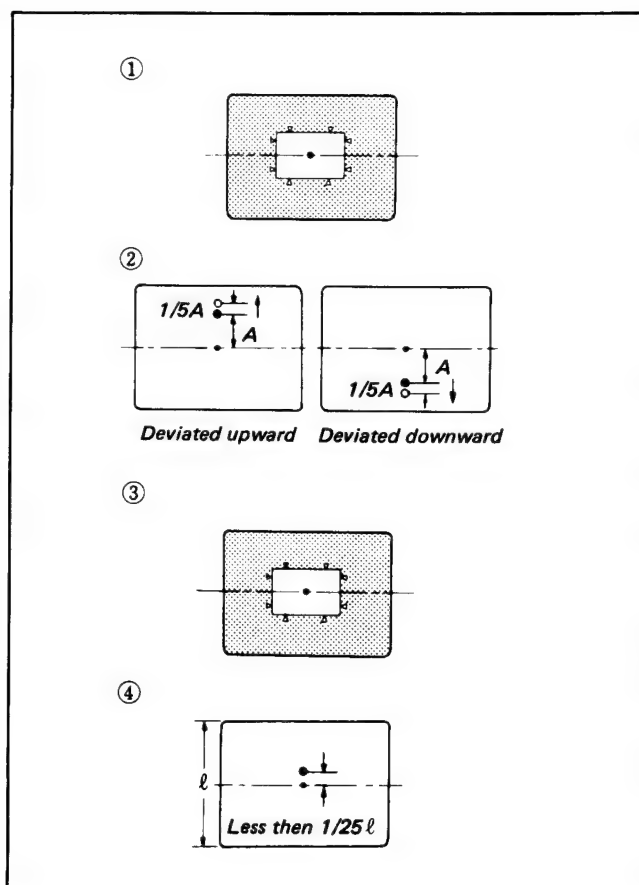


Fig. 2-17

2-3. ADJUSTMENT OF Y SYSTEM

2-3-1. Adjustment of Iris Weighting

Oscilloscope: TP504

Adjusting Procedure:

- 1) Cover the lens with a black cap.
- 2) Turn RV524 so as to align the point where the voltage is 100mV lower than the fully voltage value with the point of $4.6 \pm 0.2\text{mS}$ as shown in Fig. 2-18.

Note: LLA in the finder must have been turned on.

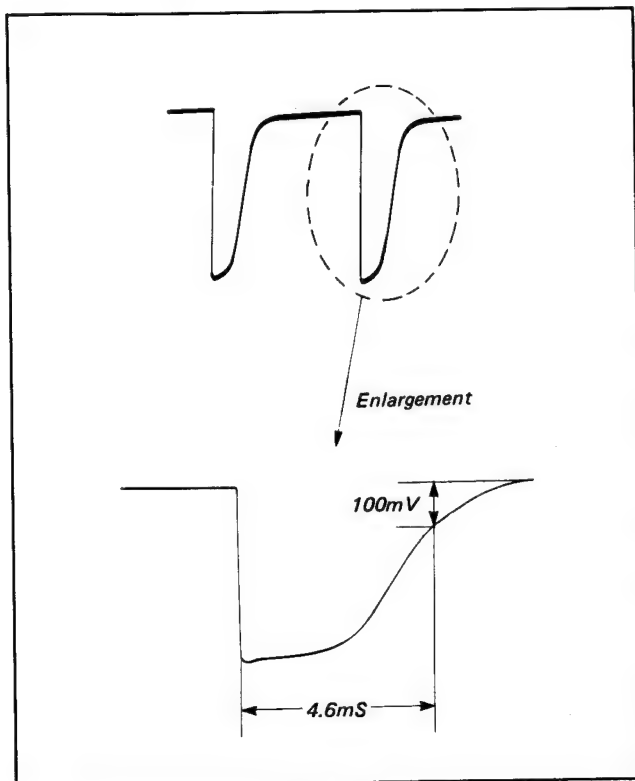


Fig. 2-18

2-3-2. Adjustment of Auto Iris

Oscilloscope: TP501

Object to be shot: Color pattern

Adjusting Procedure:

Turn RV523 so as to make the peak-to-peak value of waveform of Fig. 2-19 equal to $240 \pm 30\text{mVp-p}$.

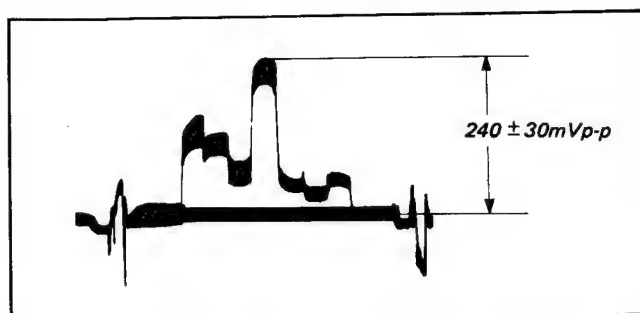


Fig. 2-19

2-3-3. Adjustment of Dark Clip

Oscilloscope: TP502, AC mode

Adjusting Procedure:

- 1) Cover the lens with a black cap.
- 2) Turn RV501 so as to make the clamped portion during blanking equal to 0V.

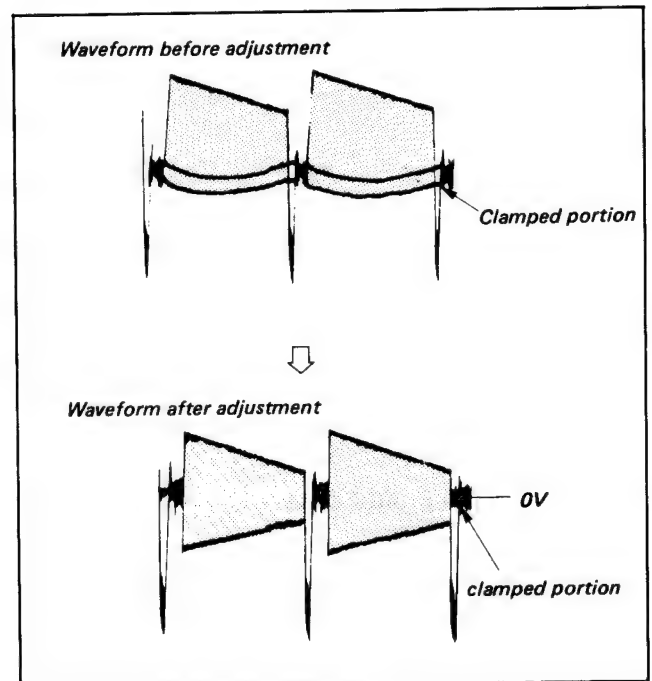


Fig. 2-20

2-3-4. Adjustment of AGC Weighting

Oscilloscope: TP503

Adjusting Procedure:

- 1) Cover the lens with a black cap.
- 2) Turn RV525 of VC-2 board so as to align the point where the voltage is 200mV lower than the full voltage value with the point of $4.6 \pm 0.2\text{mS}$ as shown below. (Fig. 2-21)

Note: LLA in the finder must have been turned on.

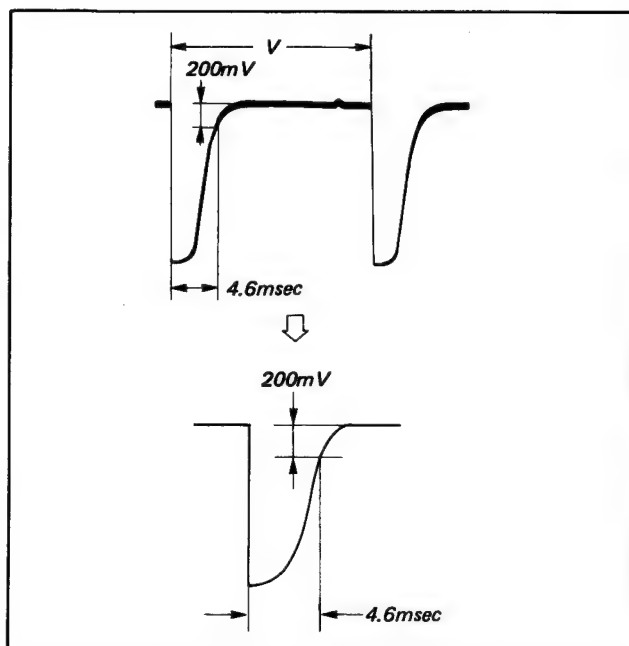


Fig. 2-21

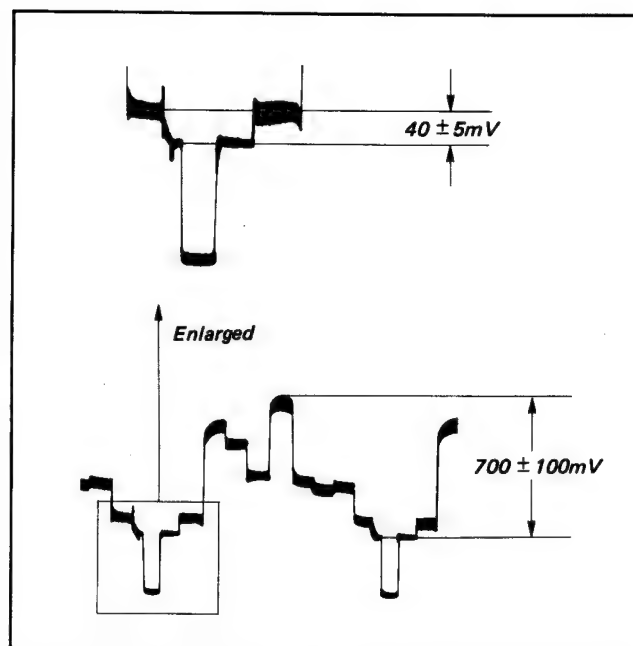


Fig. 2-23

2-3-5. Adjustment of AGC Level

Oscilloscope: TP502

Object to be shot: Color pattern

Adjusting Procedure:

Turn RV504 so as to make the peak-to-peak value of waveform shown below equal to $1.5 \pm 0.2V$.

Note: This value should be observed 3 to 4 seconds after the adjustment.

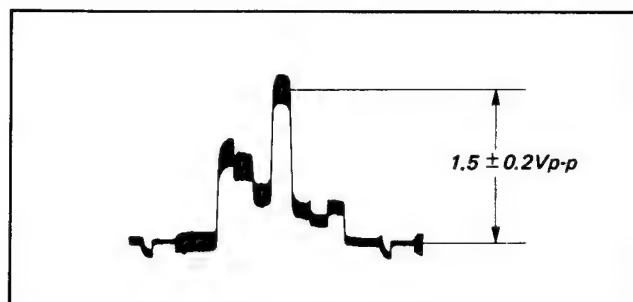


Fig. 2-22

2-3-6. Adjustment of Y Pedestal and Y Level

Oscilloscope: TP506

Object to be shot: Color pattern

Adjusting Procedure:

- 1) Turn RV505 so as to make the pedestal level equal to $40 \pm 5mV$ as shown below.
- 2) Turn RV506 so as to make Y level equal to $700 \pm 100mV$ as shown below.

3) Check the pedestal again and confirm that it is within the standard range.

4) If the pedestal is not within the standard range, readjust RV505 and RV506 and repeat the steps 1 and 2.

2-3-7. Adjustment of Base Noise Clip

Oscilloscope: TP505

Object to be shot: Color pattern

Adjusting Procedure:

Turn RV507 so as to make level equal to $10 \pm 5mV$ as shown below.



Fig. 2-24

2-3-8. Knee Adjustment

Oscilloscope: TP506

Object to be shot: High brightness pattern
(shown below)

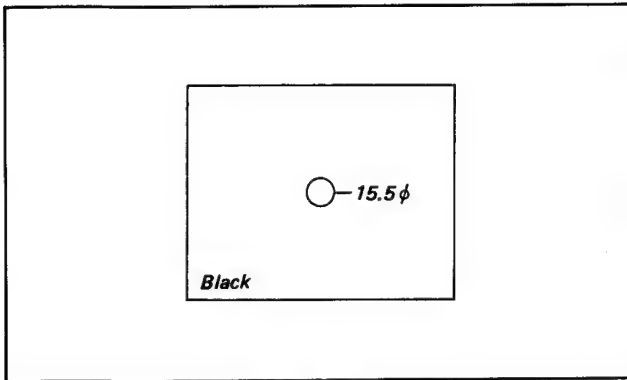


Fig. 2-25

Adjusting Procedure:

- 1) Set the zoom to telephoto end.
- 2) Turn RV502 so as to make the value of waveform of Fig. 2-26 equal to $900 \pm 100\text{mV}$.

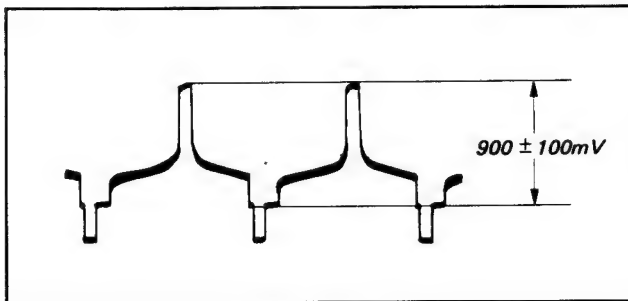


Fig. 2-26

2-3-9. LLA Adjustment

Object to be shot: Color pattern

Adjusting Procedure:

- 1) Cover the lens with ND filters 0.4 and 1.0 and adjust RV522 on VC-1 board so as to turn on LLA lamp.
- 2) Remove ND filters 0.4 and 1.0 from the front of lens.
- 3) Cover the lens with ND filters 0.1 and 1.0 and confirm that the LLA lamp will be turned off. If it does not, adjust RV522 so as to turn off LLA lamp.
- 4) Repeat steps 1 and 3 once again for confirming the adjustment.

2-4. ADJUSTMENT OF CHROMA SYSTEM

2-4-1. Adjustment of Burst Level

Oscilloscope: TP514

Adjusting Procedure:

- 1) Cover the lens with a black cap.
- 2) Turn RV521 so as to make the burst level equal to $280 \pm 10\text{mV}$ as shown below.

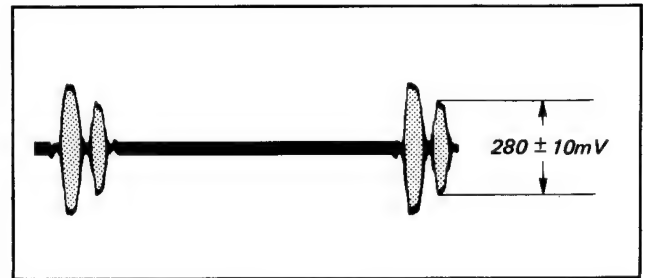


Fig. 2-27

2-4-2. Adjustment of HV Phase Correction

Oscilloscope: CH-1: TP509 } X-Y mode
CH-2: TP508 }

Object to be shot: White pattern

Adjusting Procedure:

- 1) Shoot the white pattern with 5% cut.

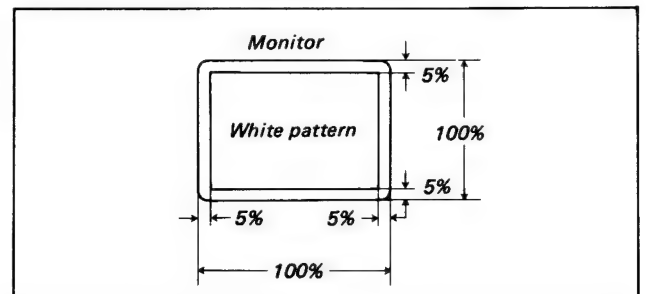


Fig. 2-28

- 2) Cover with a red filter.
- 3) Adjust with RV511 and RV512 so as to make the size of spot minimum. (Fig. 2-29)

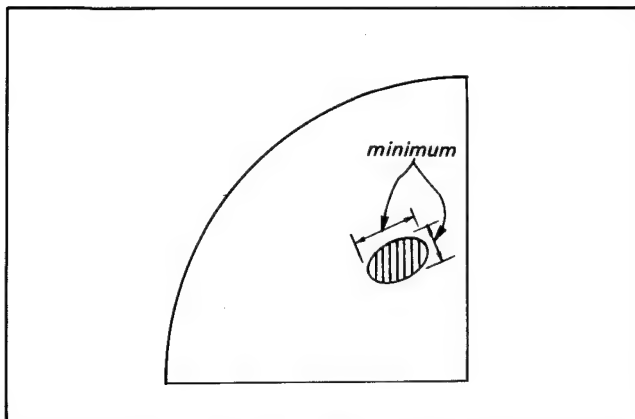


Fig. 2-29

2-4-3. Adjustment of Chroma Index Separation

Oscilloscope: CH-1: TP509 } X-Y mode
CH-2: TP508 }

Object to be shot: Color pattern

Adjusting Procedure:

Adjust with RV509 and L504 alternately to overlap spots as many as possible.

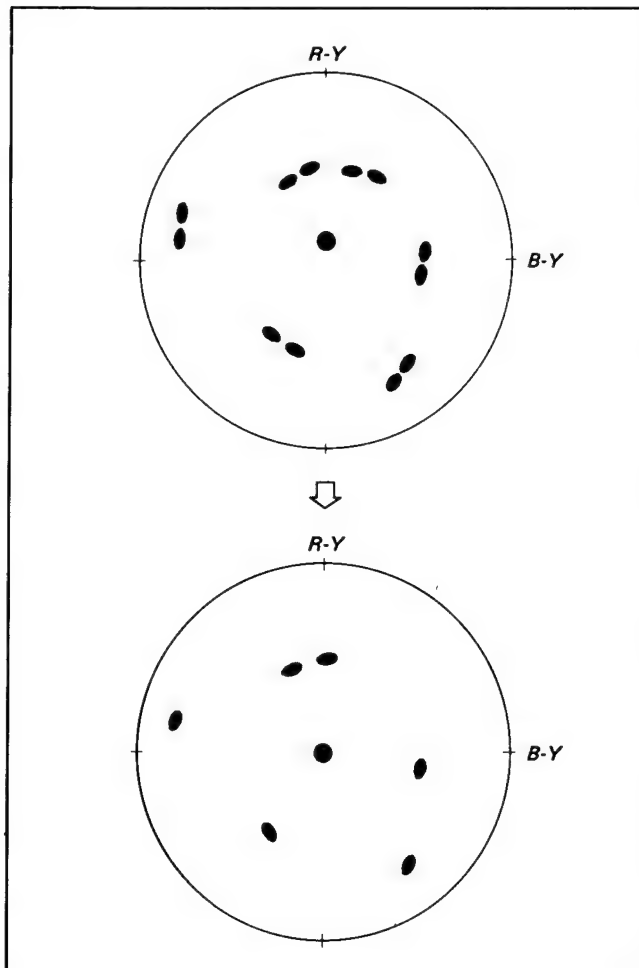


Fig. 2-30

2-4-4. Adjustment of Chroma Compression

Oscilloscope: TP510

Object to be shot: Color pattern

Adjusting Procedure:

- 1) Set filter selector to ☼ (indoor), and depress the white balance button to turn off W in the finder.
- 2) Cover the lens with a black cap.
- 3) Turn RV503 so as to make the output equal to $450 \pm 30\text{mV}$ in DC level.
- 4) Confirm the color reproducibility.

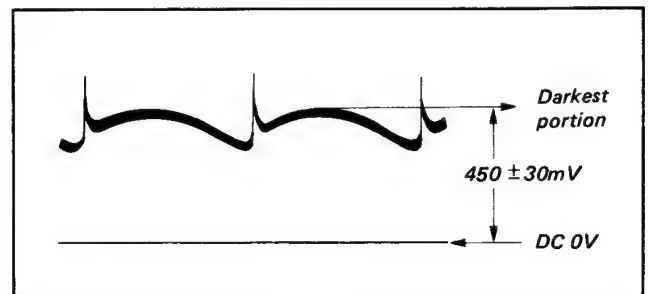


Fig. 2-31

2-4-5. Auto White Balance

Oscilloscope: CH-1: TP509 } X-Y mode
CH-2: TP508 }

Object to be shot: White pattern

Adjusting Procedure:

- 1) Set filter switch to ☼ (indoor).
- 2) Adjust with RV516 and RV517 so as to let the spot become the origin when white balance button is depressed.

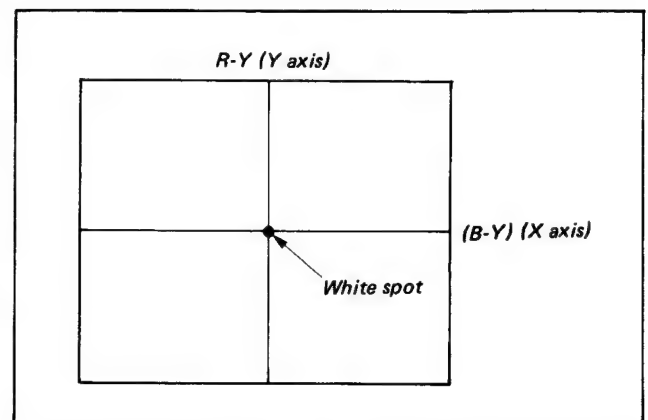


Fig. 2-32

- 3) Confirm that "W" in the view finder is turned off.
- 4) Confirm that the spot will deviate when the filter switch is switched to ☼ (outdoor).

2-4-6. Adjustment of Color Reproducibility

1. Adjustment of Chroma Level Phase

- 1) Oscilloscope: CH-1: TP509 } X-Y mode
CH-2: TP508 }

Cover with a black cap.

- 2) Connect the red clip of 5.4MHz oscillator jig to TP501 and the black clip to TP515.
3) Make the shape as round as possible by adjusting with RV515 and RV526.

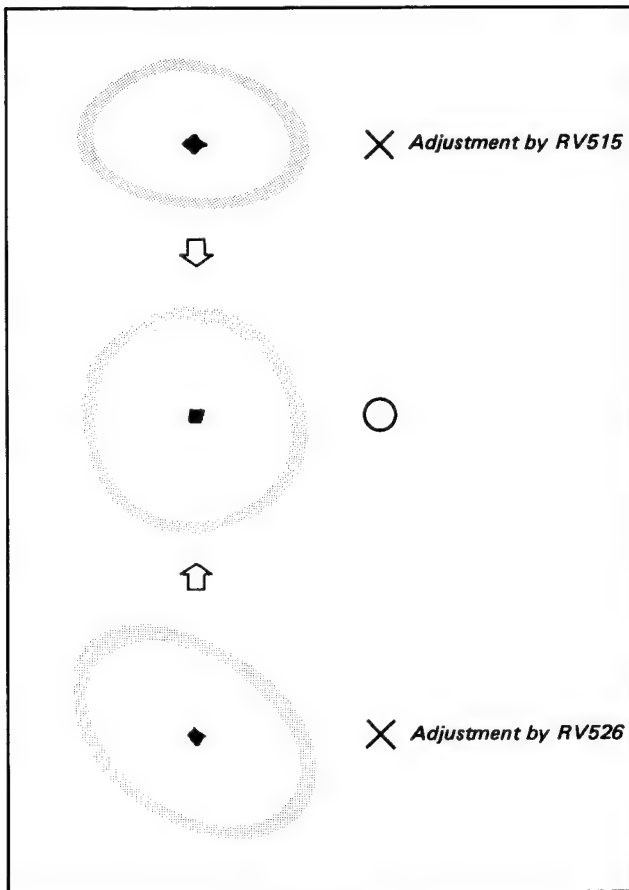


Fig. 2-33

- 4) Remove the black cap.

- 5) Oscilloscope: TP514

Adjust RV508 to bring the larger of red levels A and B to $150 \pm 10\text{mV}$.

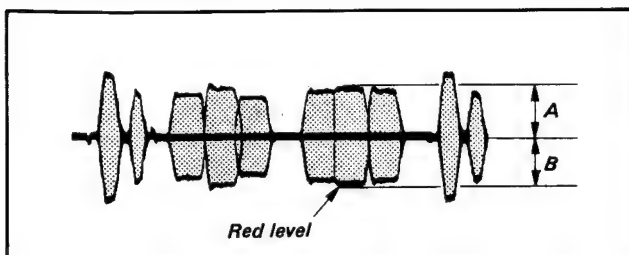


Fig. 2-34

2. Adjustment of Carrier Balance

Oscilloscope: TP514

Object to be shot: Color pattern

Adjusting Procedure:

Adjust with RV518 and RV519 so as to make the carrier component minimum.

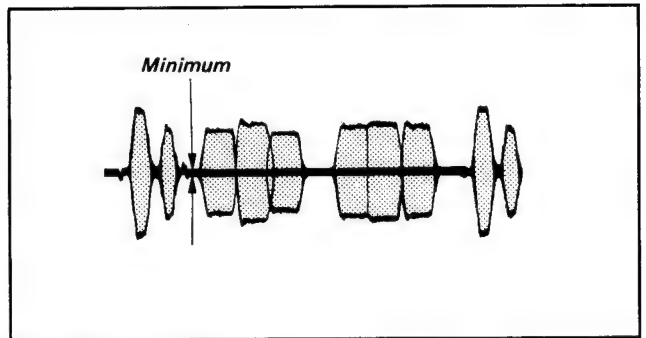


Fig. 2-35

3. HUE Adjustment

Oscilloscope: CH-1: TP509 } X-Y mode
CH-2: TP508 }

Adjusting Procedure:

Adjust with RV510 so as to have the red spots located within the standard phase frame.




4. Adjustment of White Balance

Oscilloscope : CH-1 : TP509 } X-Y mode
CH-2 : TP508 }

Object to be shot: Color pattern

Adjusting Procedure:

- 1) Adjust with RV513 and RV514 so as to let the white spot become the origin. (Fig. 2-36)

Note: Switch the filter switch from  (indoor) to  (outdoor) and to  and adjust the white balance while "W" is lighted.

- 2) Confirm that all color spots located within the standard phase frame.
3) If the above step 2) is not satisfied, repeat above steps 3 through 4.

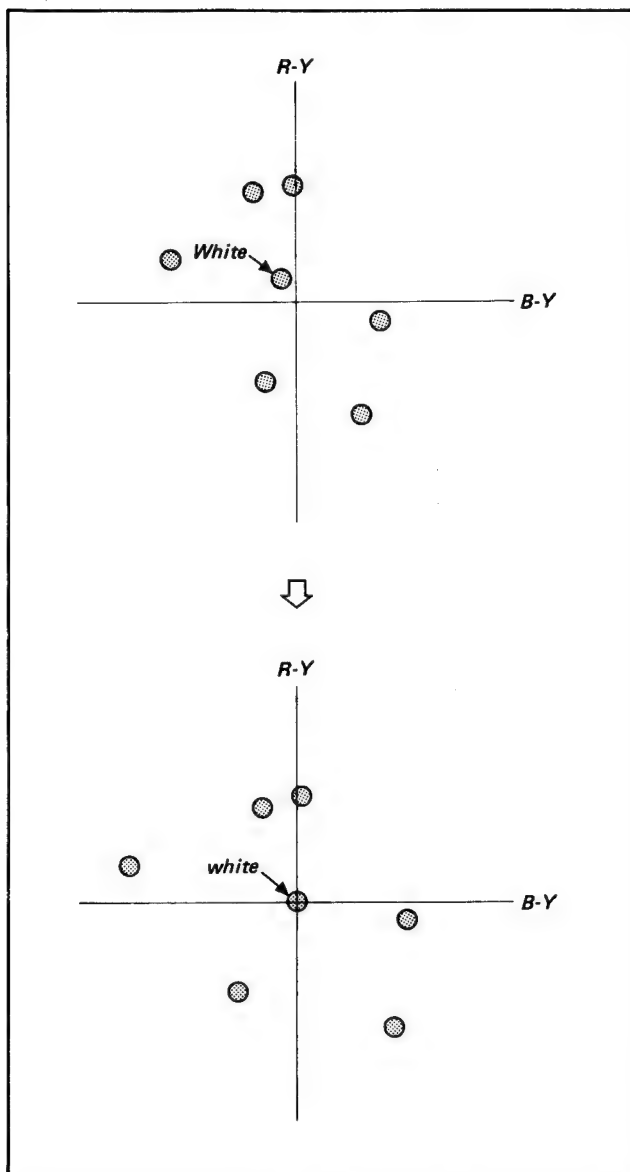


Fig. 2-36

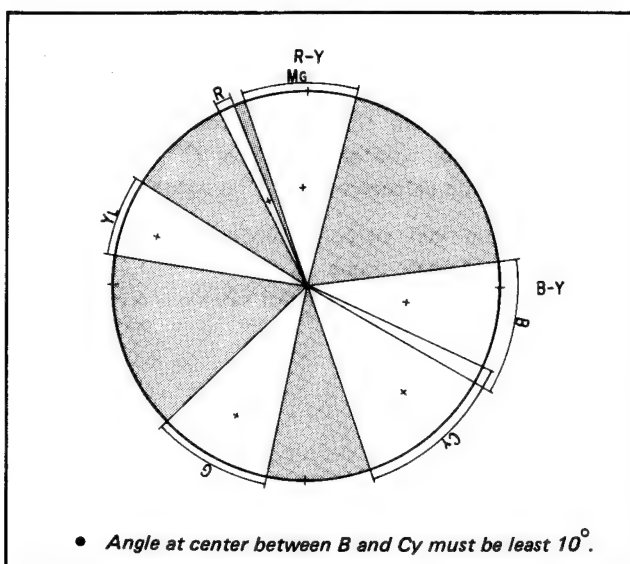


Fig. 2-37 Standard phase frame

2-4-7. PLL Adjustment (GC-3 Board)

Oscilloscope: CH-1, Point A (VC-2 Board)

External SYNC: TP511 (HD pulse)

Adjustment Procedure:

- 1) Short pins ① and ② of IC651 (GC-3 board) together.
- 2) Disconnect points A and B on VC-2 board by unsoldering. (Fig. 2-38)

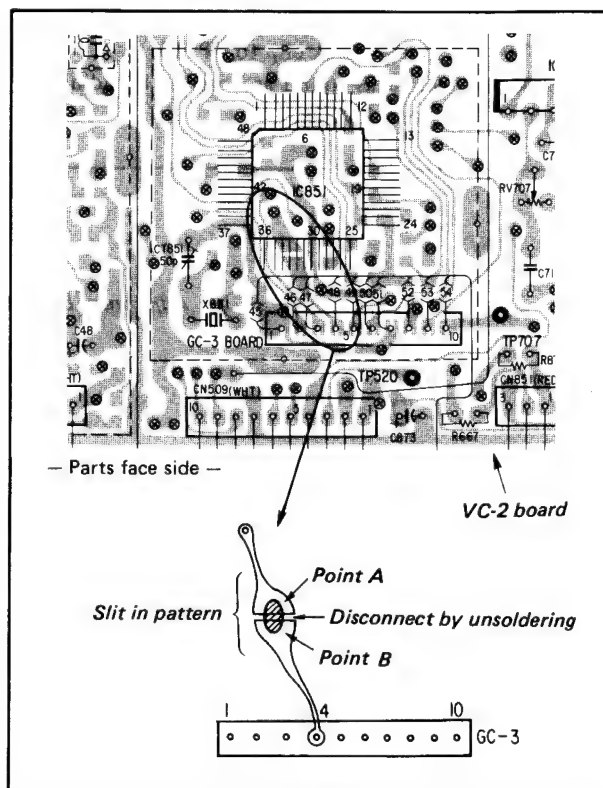


Fig. 2-38

- 3) Adjust CT651 to minimize fluctuation of beats. (Fig. 2-39)

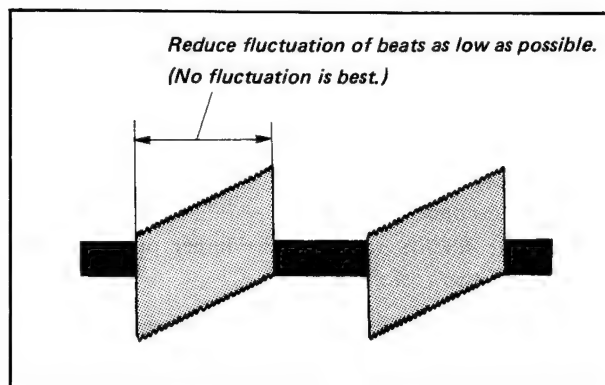


Fig. 2-39

- 4) Join points A and B by soldering, and disconnect pins ① and ② of IC651.
- 5) Check that the voltage at point A is 1.75V with a digital voltmeter.
- 6) If requirement 5) is not met, repeat 1) through 5).

SECTION 3

ALIGNMENT OF MECHANICAL COMPONENTS (VIDEO SECTION)

3-1. PREPARATION FOR CHECKING, ALIGNMENT, AND REPLACEMENT OF MECHANICAL COMPONENTS

3-1-1. Removal of Cabinet

- 1) Remove the three screws ①, and remove the lens cabinet, right ②.
- 2) Remove the three screws ③, and remove the lens cabinet, left ④.
- 3) While opening the lens cabinet (T) ass'y ⑤ in the direction of the arrow (a), remove it in the direction of the arrow (b).
- 4) Remove the ACC shoe stopper screw ⑥, and remove the ACC shoe leaf spring ⑦.
- 5) Remove the two screws ⑧, and remove the ACC shoe ⑨.
- 6) Remove the two face screws ⑩, and remove the cassette compartment lid ass'y ⑪.
- 7) Remove the four screws ⑫, and remove the cabinet, left ⑬.
- 8) Remove the four screws ⑭, and remove the cabinet, right ⑮.

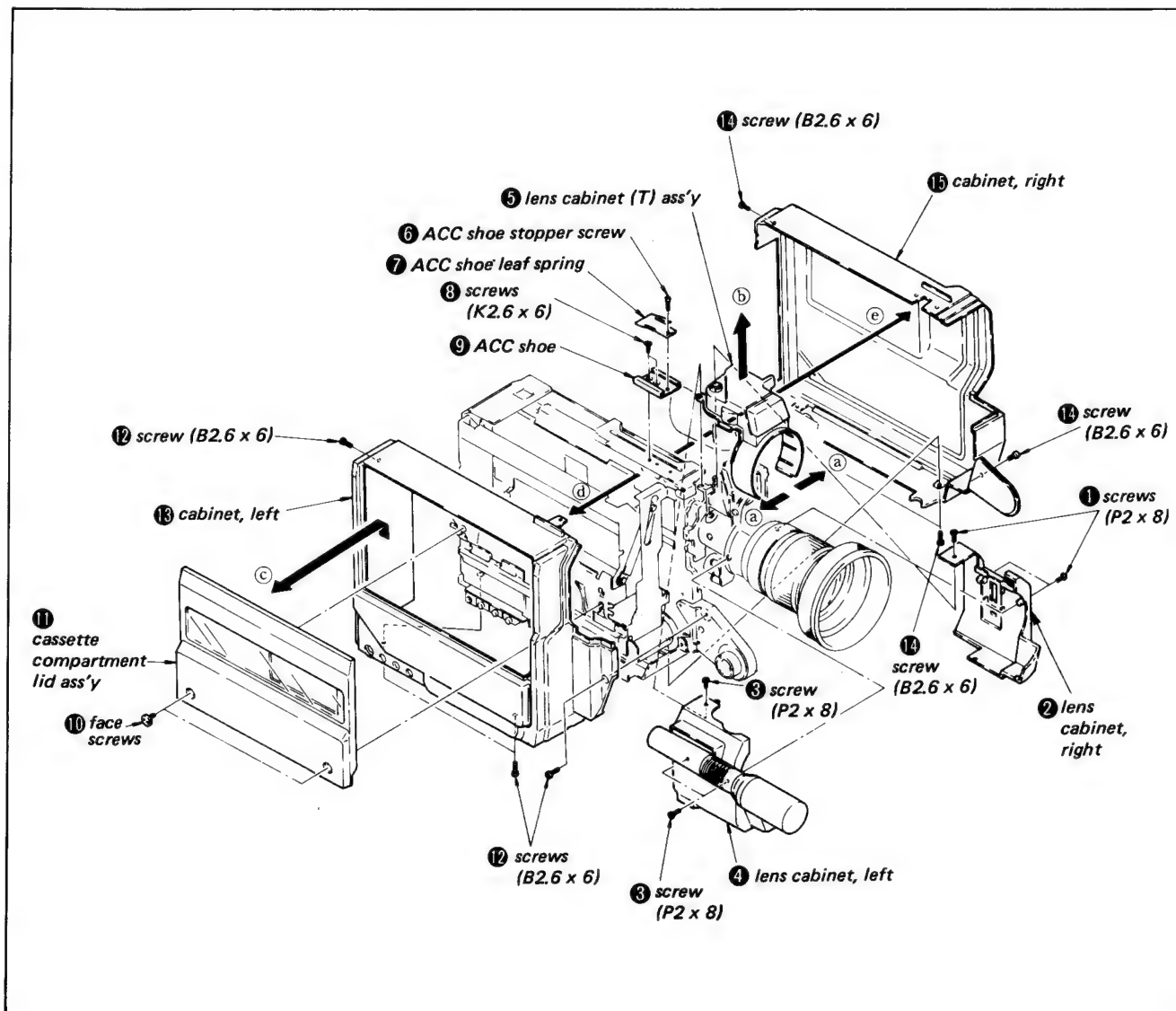


Fig. 3-1

3-1-2. Removal of Cassette Ass'y

- 1) Remove the screw ①.
- 2) Remove the four screws ②.
- 3) Turn down AU-3 and AU-4 boards in the direction of the arrow ③.
- 4) Remove the cassette compartment ass'y ④.

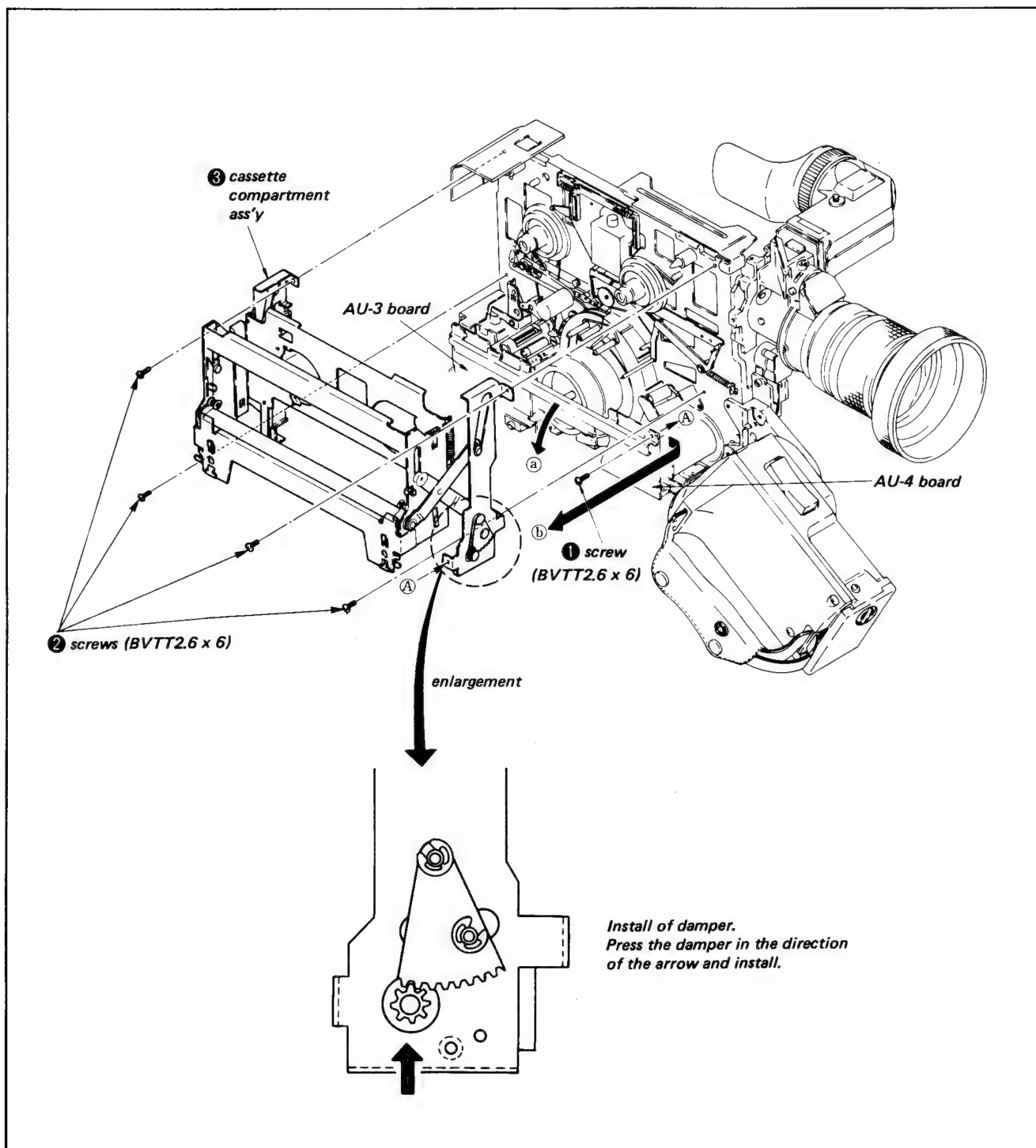


Fig. 3-2

3-1-3. Method of Opening VC-2, SS-17 and PA-1 Boards

- 1) Remove the two screws ① .
- 2) Pull out the earth pin ② .
- 3) Open the VC-2 board ③ .
- 4) Remove the screw ④ and remove SW-28 board ⑤ .
- 5) Remove the three screws ⑥ , and open SS-17 board in the direction of the arrow ⑥ .
- 6) Remove the solder from the three soldered sections of PA-1 board ⑧ , and open in the direction of the arrow ⑦ .

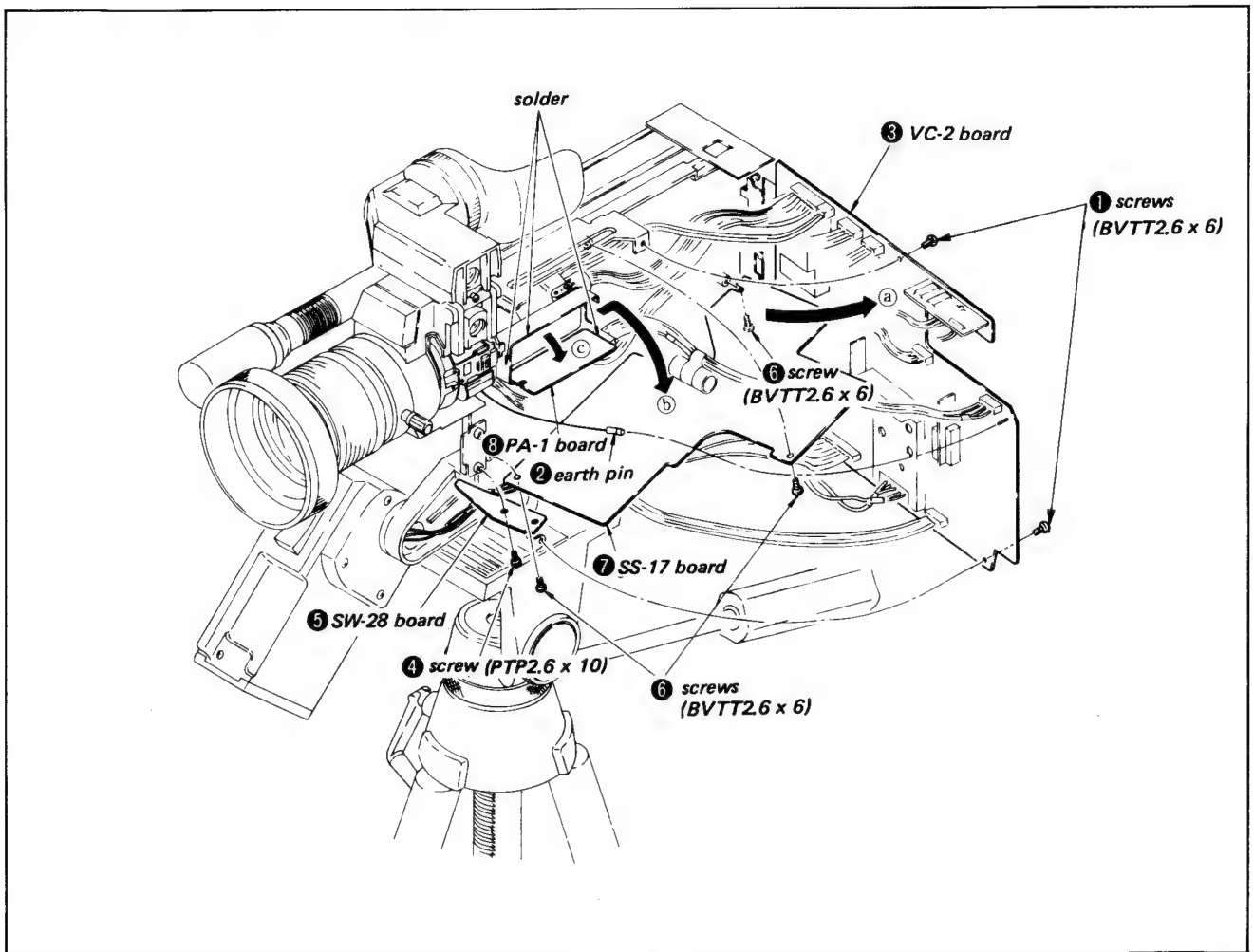


Fig. 3-3

3-2. PERIODIC CHECKS AND MAINTENANCE

The following routine inspections and maintenance procedures are recommended to assure proper functioning and performance of the set, and to extend the life of the machine and the tapes.

3-2-1. Maintenance After Servicing

After the set has been serviced, the following maintenance items must be carried out, regardless of the length of time that the set has been in use.

1. Upper Drum (Rotary Drum)

- 1) Clean the rotary drum using the cleaning piece (Ref. No. J6) soaked in cleaning fluid (Ref. No. J4). Press the cleaning piece lightly against the rotary drum while rotating the drum manually in the counterclockwise direction. (Never clean by rotating the drum under power, or in the clockwise direction. Clockwise rotation will cause the drum belt to come off or slip from the proper position, causing operating problems.)
- 2) Also, never clean the video head by moving the cleaning piece in the perpendicular direction. There is a strong possibility that such a procedure will damage the video head.

2. Cleaning the Tape Running System

- 1) Clean the tape guide, drum face, capstan shaft, and pinch roller using a cleaning piece soaked in cleaning fluid.

3. Cleaning the Drive System

- 1) Clean the drive section (belt, reel, other) using a cloth soaked in cleaning fluid.

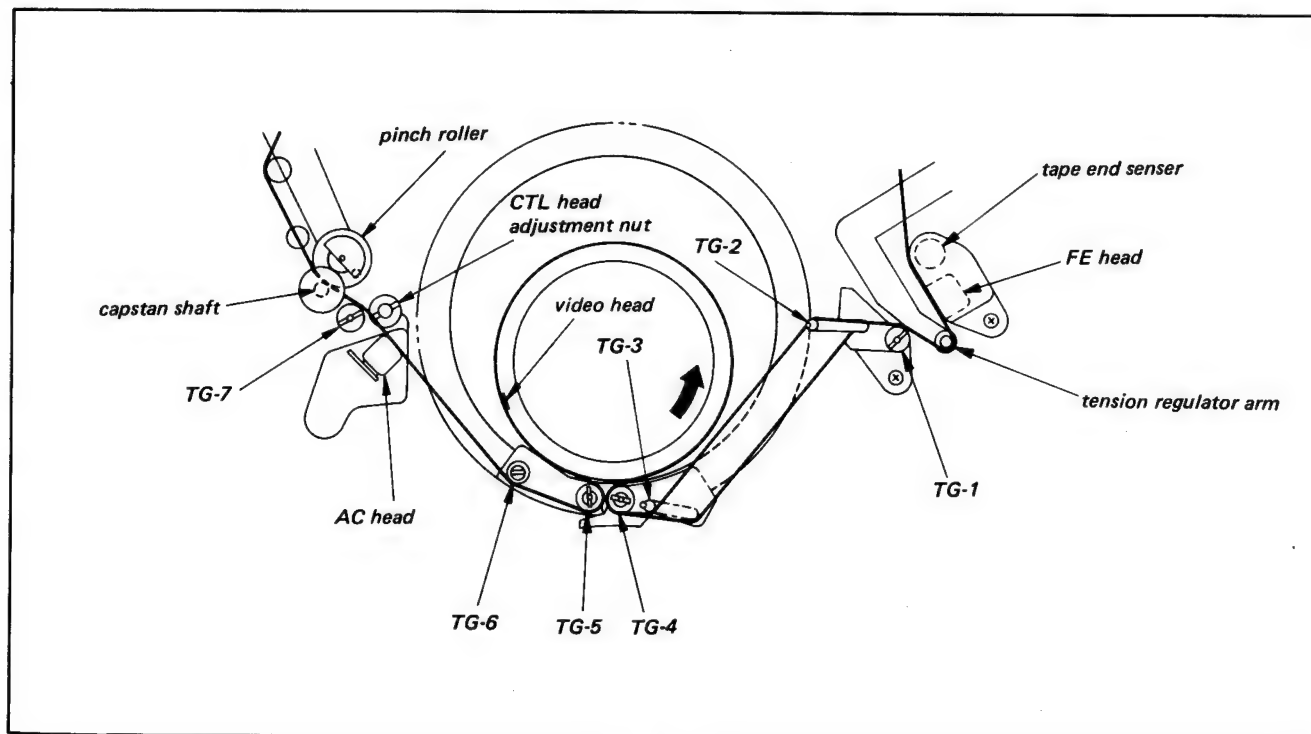


Fig. 3-4

3-2-2. Periodic Check Items

Carry out maintenance checks for the following items according to the length of time the unit has been in use.

○ : Cleaning, ◎ : Lubrication, ★ : Replacement, ☆ : Checking

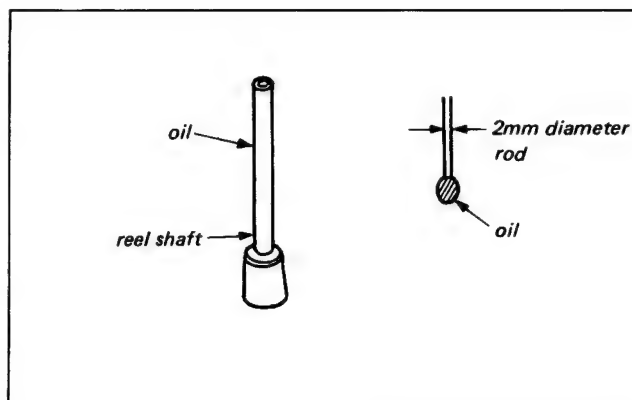
Maintenance checks		Operating period (H) Replacement Part No.	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	Remarks
Tape Running System	Cleaning of running surface of tape	—	○	○	○	○	○	○	○	○	○	○	These procedures must be carried out at each servicing. Use light pressure on the AC head as too much force can move it out of position.
	Cleaning and degaussing AC head ass'y	A-6736-038-A	○	○	○	○	○	○	○	○	○	○	
	Cleaning and degaussing rotary drum	A-6762-154-A	○	○	○	○	○	○	○	○	○	○	The operating environment and method of use greatly affect the longevity of the video head.
	FE head	8-825-561-10	○	○	○	○	○	○	○	★	○	○	
Drive System	FWD belt	3-681-447-00	○	○	○	○	○	○	○	★	○	○	<ul style="list-style-type: none"> • These belts must be checked at each servicing. • Parts should be replaced at the operating intervals indicated, or every two years. • The tape speed should always be checked when replacing the capstan belt and the relay belt.
	Loading belt	3-681-424-00	○	○	○	○	○	○	○	○	○	○	
	Drum belt	3-681-446-00	○	○	○	○	○	○	○	○	○	○	
	Capstan belt	3-681-444-00	○	○	★	○	○	★	○	○	★	○	
	Relay belt	3-681-445-00	○	○	○	○	○	○	○	○	○	○	
	Cleaning iron core and opening of brake solenoid	1-454-357-11	—	—	—	○	—	—	—	○	—	—	
	Cleaning iron core and opening of pinch solenoid	1-454-357-21	—	—	—	○	—	—	—	○	—	—	
	Take-up reel	X-3681-404-0	—	☆	—	★	—	☆	—	★	—	☆	
	Capstan bearing	A-6735-050-A	—	◎	—	◎	—	◎	—	◎	—	◎	
	Drum motor	8-835-099-01	—	○	—	★	—	○	—	★	—	○	
Performance Checks	Abnormal sound	—	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Measurement of back tension	—	—	☆	—	☆	—	☆	—	☆	—	☆	Standard is 35 to 40g (measured with SL-0011).
	Brake system	—	—	☆	—	☆	—	☆	—	☆	—	☆	Check edit function adjustment.
	Measurement of FWD torque	—	—	☆	—	☆	—	☆	—	☆	—	☆	Check using SL-0003C. Standard is 40 $\begin{smallmatrix} +10 \\ -14 \end{smallmatrix}$ g-cm
	Tape speed	3-682-740-00	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Check tape speed adjustment. Replace midway pulley (P) as required.

Note 1: OVERHAUL

When overhauling the unit, replace the parts referring to the outline above. The loading motor is not included in the above and should be overhauled about every 20,000 operations.

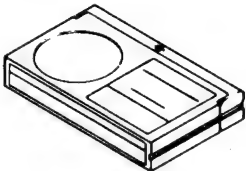
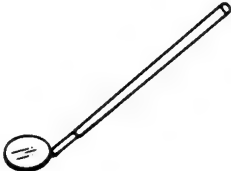
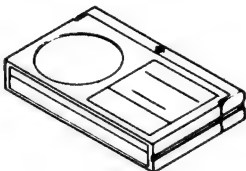

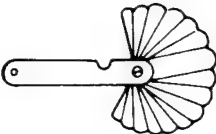

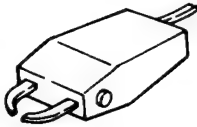
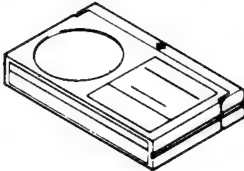
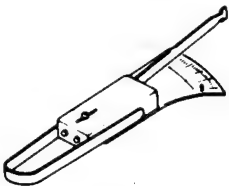
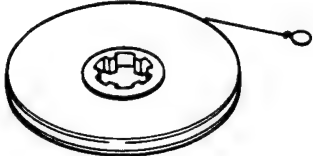
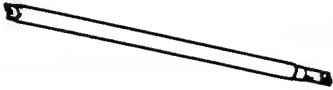
Note 2: SONY Oil

- * SONY oil should always be used. (If oil of a different viscosity is used the correct functioning of the unit cannot be assured.)
SONY oil: Part No. 7-661-018-01
- * Always use clean SONY oil to for lubricate the bearings. (Dirty oil can cause the bearings to overheat and be subjected to excessive wear.)
- * The amount of oil to be applied is shown in the following diagram. One drop should be used at the tip of a 2mm diameter rod.



3-2-3. Summary of Servicing Tools

Ref. No.	Name	Cord No.	Fixture No.	Use, etc.
J1	Forward back tension measurement tape	J-6080-003-C	SL-0003C	FWD torque measurement
J2	Small adjustment mirror	J-6080-029-A J-6080-030-1	SL-5052	Tape pass adjustment and tape running system check
J3	Alignment tape	8-969-995-13	KR5-3C	Tracking and tape path adjustment
		8-969-995-52	KR5-2H	
J4	Cleaning fluid	Y-2031-001-0		
J5	Thickness gauge	9-911-053-00		Opening adjustment
J6	Cleaning piece	2-034-697-00		Cleaning all sections
J7	Head demagnetizer			Video, audio head degaussing
J8	Lapping tape	8-888-004-00		Video head cleaning
J9	Sector type gauge (for 50g)	7-732-050-20		FWD back tension measurement
J10	Reel table tension gauge	J-6080-011-A	SL-0011	FWD back tension measurement
J11	Driver, tape path	J-6080-811-A		Tape guide adjustment

J1 	J2 	J3 
J4 	J5 	J6 
J7 	J8 	J9 
J10 	J11 	

3-3. REMOVAL AND ADJUSTMENT OF MECHANICAL PARTS

Handling Machinery with Cassette Compartment Ass'y Removed

[Threading Method]

- 1) Press the arm lock ① in the direction of arrow (A), and turn the microswitch ② ON.
- 2) Move the lock arm ③ in the direction of the arrow (B).
- 3) Press the lock detection assembly ④.
- 4) Move the push plate ⑤ in the direction of the arrow (C), turn the microswitch ⑥ ON, and start the threading ⑤ operation.

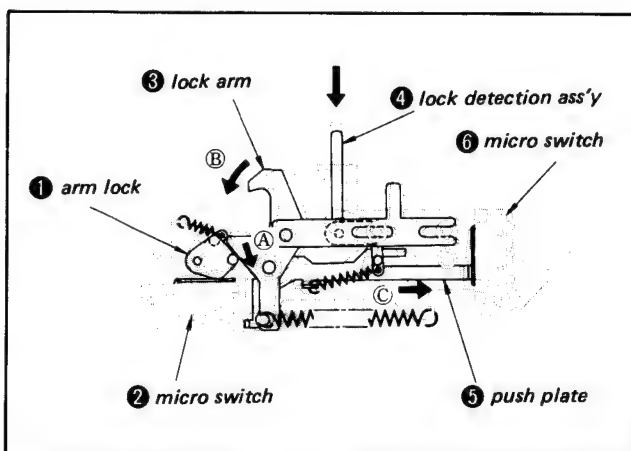


Fig. 3-5 (a)

[Recording Method]

- 1) Complete the threading operation.
- 2) While pressing the lock detection ass'y ①, press the REC START/STOP button on the grip block.

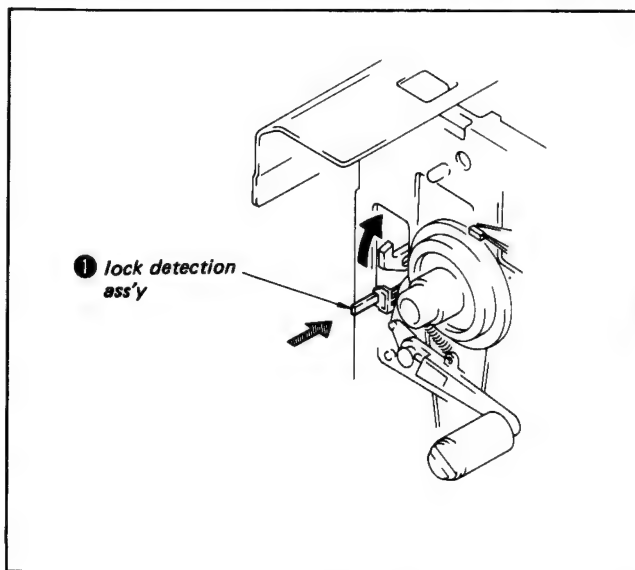


Fig. 3-5 (b)

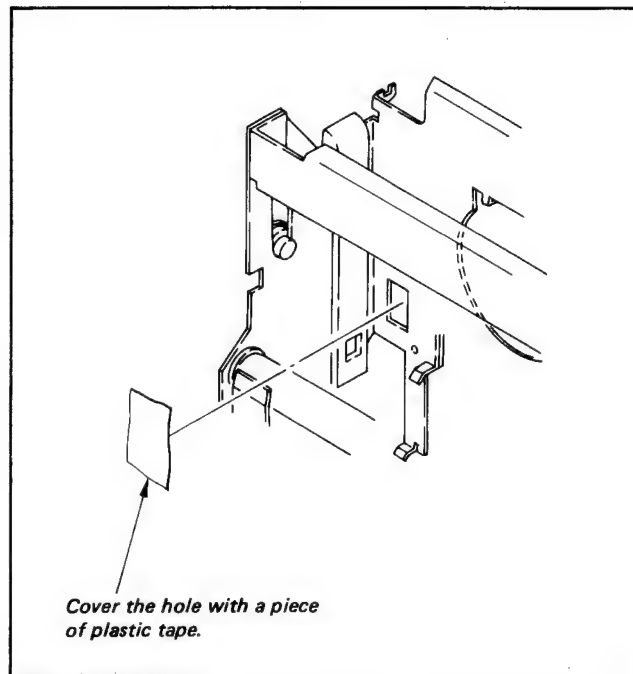


Fig. 3-6

3-3-1. Removal of Mechanical Parts

1. Removal of Cassette Compartment Lock Ass'y

- 1) Pull out the connector ①.
- 2) Remove the two screws ②.
- 3) Remove the cassette compartment lock ass'y.

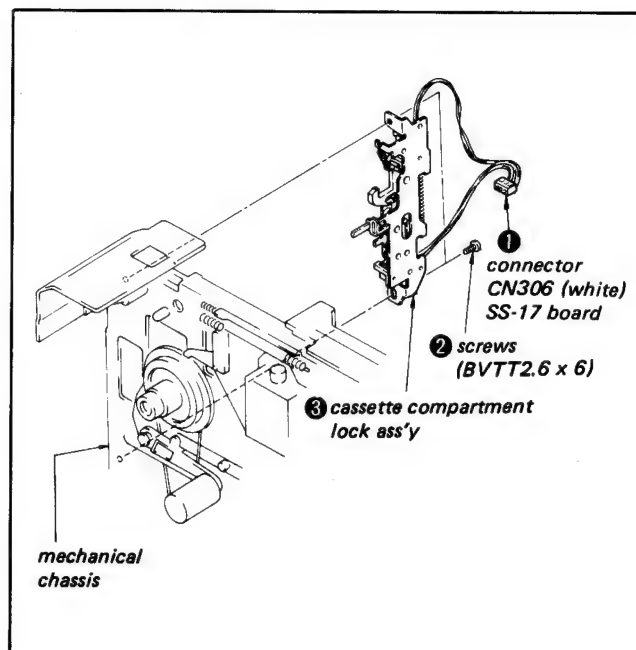


Fig. 3-7

2. Removal of Brake Solenoid Ass'y

- When removing or replacing this unit, adjust the "brake solenoid location" and the "edit" function.

- 1) Pull out the connector ①.
- 2) Remove the two screws ②.
- 3) Remove the brake solenoid ③.
- 4) Remove the two screws ④ and the BS cover ⑤.
- 5) Pull out the spring pin ⑥, and remove the brake solenoid ⑦.

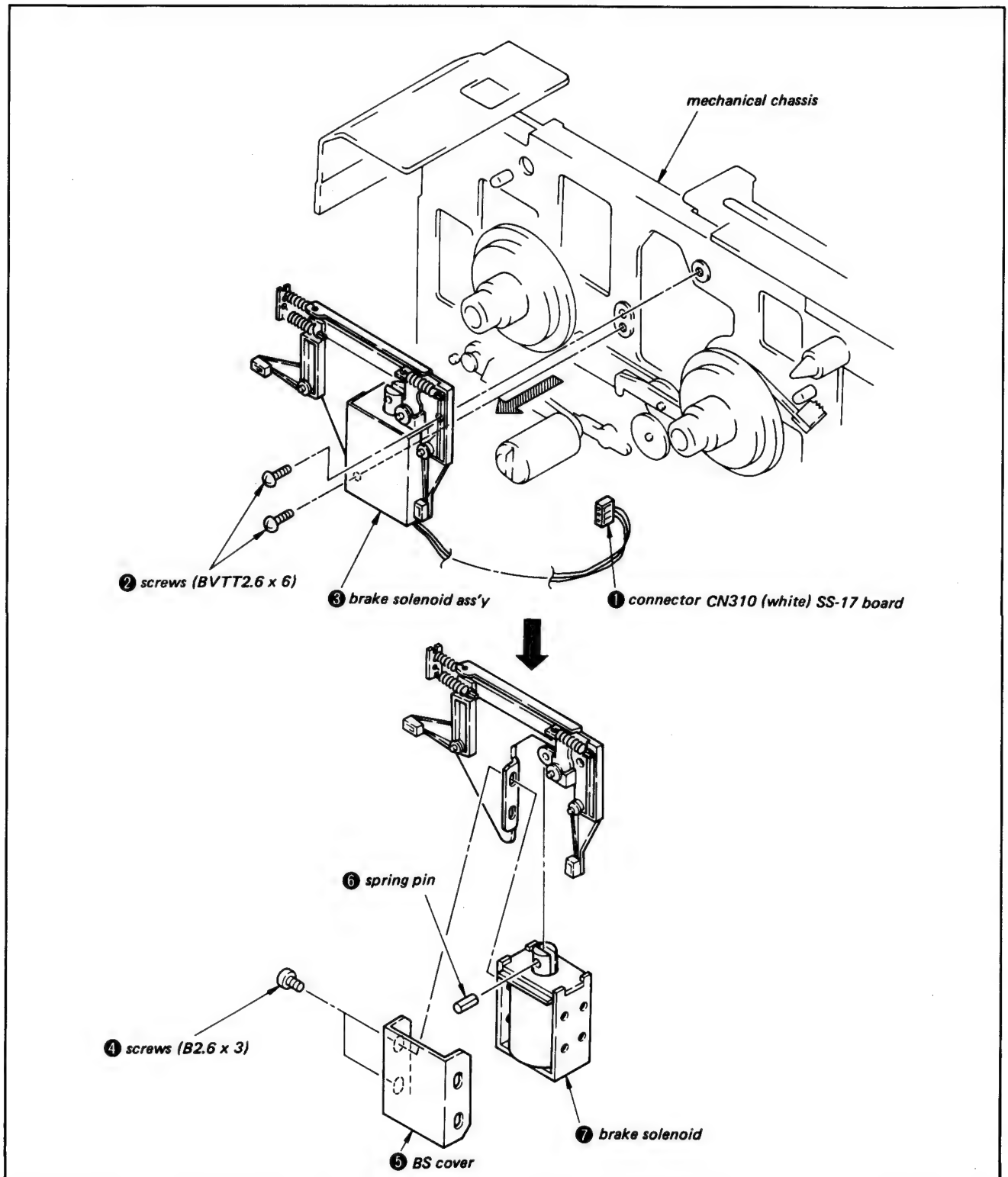


Fig. 3-8

3. Removal of the S Reel

- 1) Remove the stopper washer (2.3) ① .
- 2) Remove the S reel ② .

Note: Take care not to lose the thrust bearing.

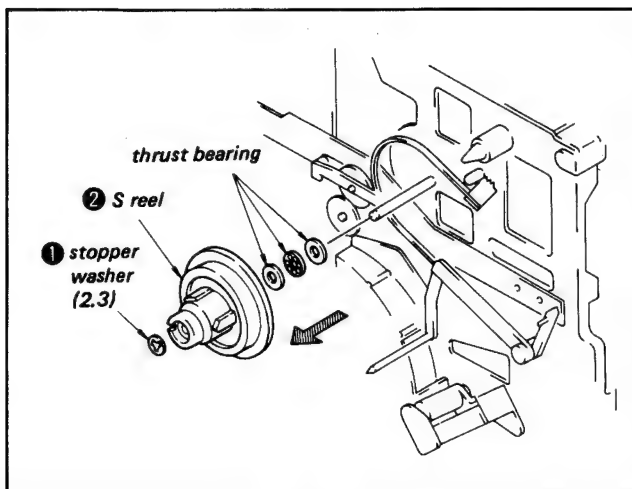


Fig. 3-9

4. Removal of the T Reel

- 1) Remove the stopper washer (2.3) ① .
- 2) Remove the FWD belt ② .
- 3) Remove the T reel ③ .

Note: Take care not to lose the washers (1 or 2, depending on the set).

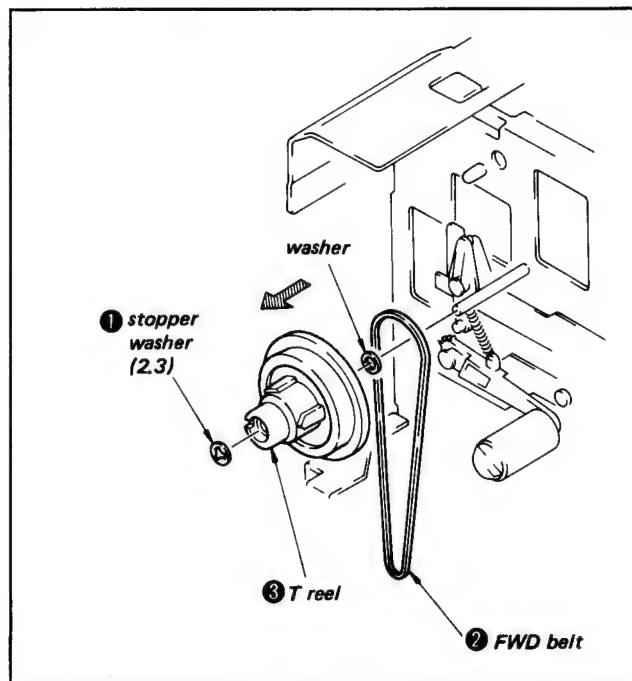


Fig. 3-10

5. Removal of Pinch Roller Ass'y

- When removing or replacing this unit, perform the "pinch roller location adjustment".

- 1) Remove the stopper washer (2.3) ① .
- 2) Remove the tension spring ② .
- 3) Remove the pinch roller ass'y ③ .

Note: Take care not to lose the washer.

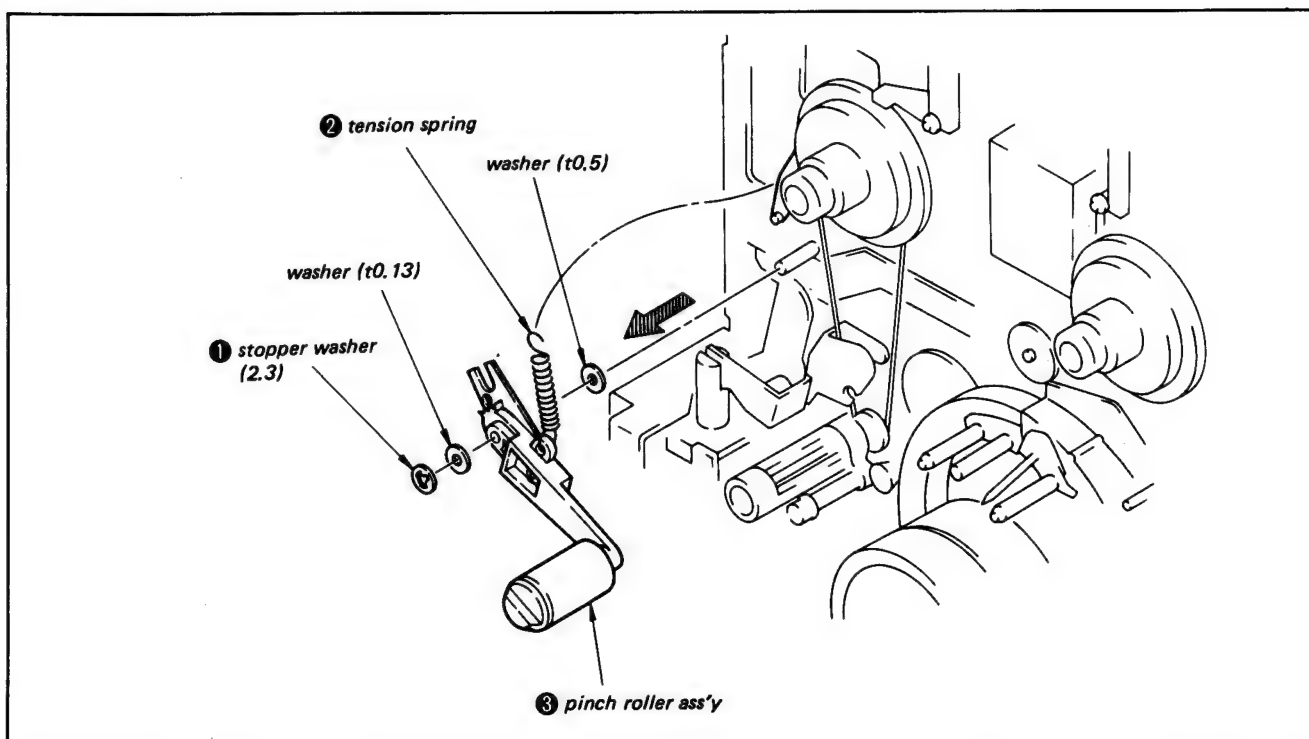


Fig. 3-11

6. Removal of Loading Motor Ass'y

- 1) Remove the screw ①.
- 2) Remove the connector ② or the solder (A section).
- 3) Remove the loading motor ass'y ③.

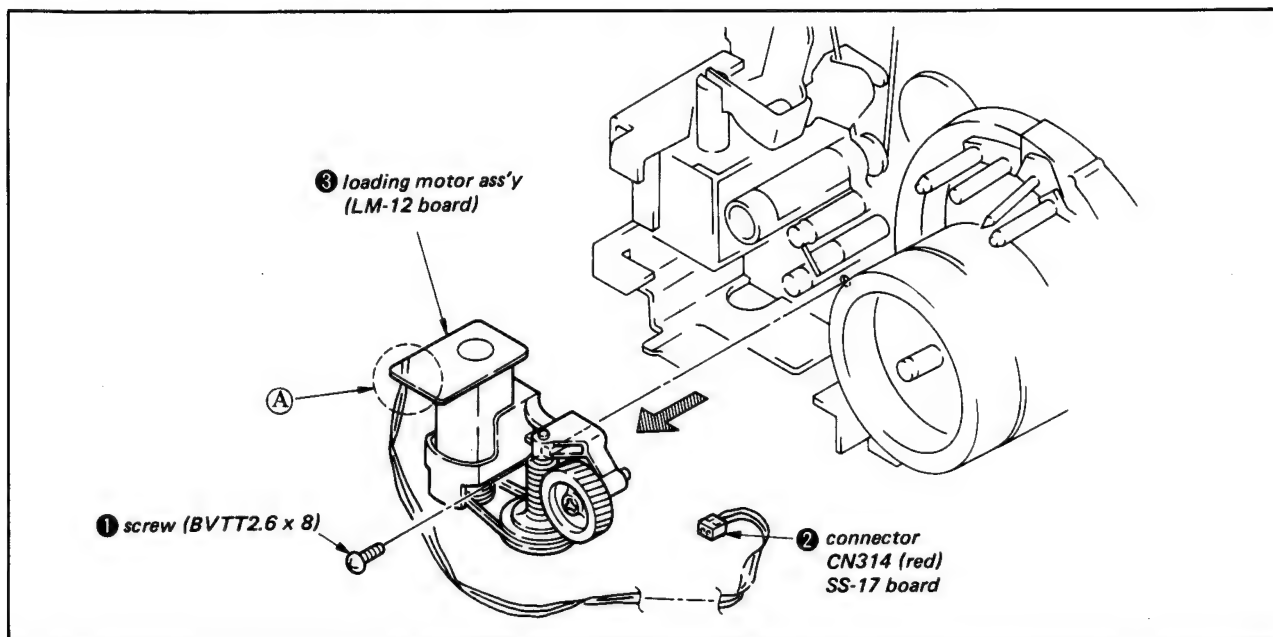


Fig. 3-12

7. Removal of Pinch Solenoid Ass'y

- When removing or replacing this unit, adjust the "pinch solenoid location" and the "edit" function.

[Precautions to be taken on installation]

As shown in Fig. 3-13, twist in the direction of the arrow and secure.

If not twisted, the plunger will not operate smoothly.

- 1) Remove the tension spring ①.
- 2) Pull out the connector ②.
- 3) Remove the two stopper washers (2.3) ③.
- 4) Remove the two screws ④.
- 5) Press the FWD belt in the direction of the arrow (A), and remove the pinch solenoid ass'y ⑤.

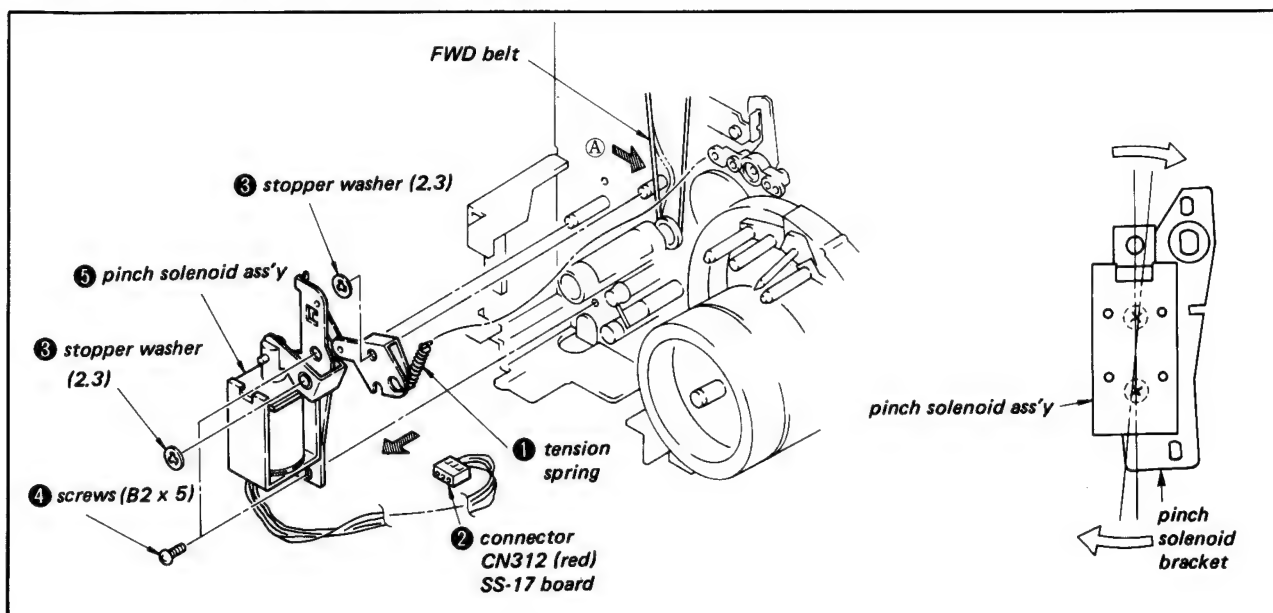


Fig. 3-13

8. Removal of Drum Motor Ass'y

- 1) Remove the drum belt ①.
- 2) Remove the two screws ②.
- 3) Remove the connector ③ or the solder (A section).
- 4) Remove the drum motor ass'y.

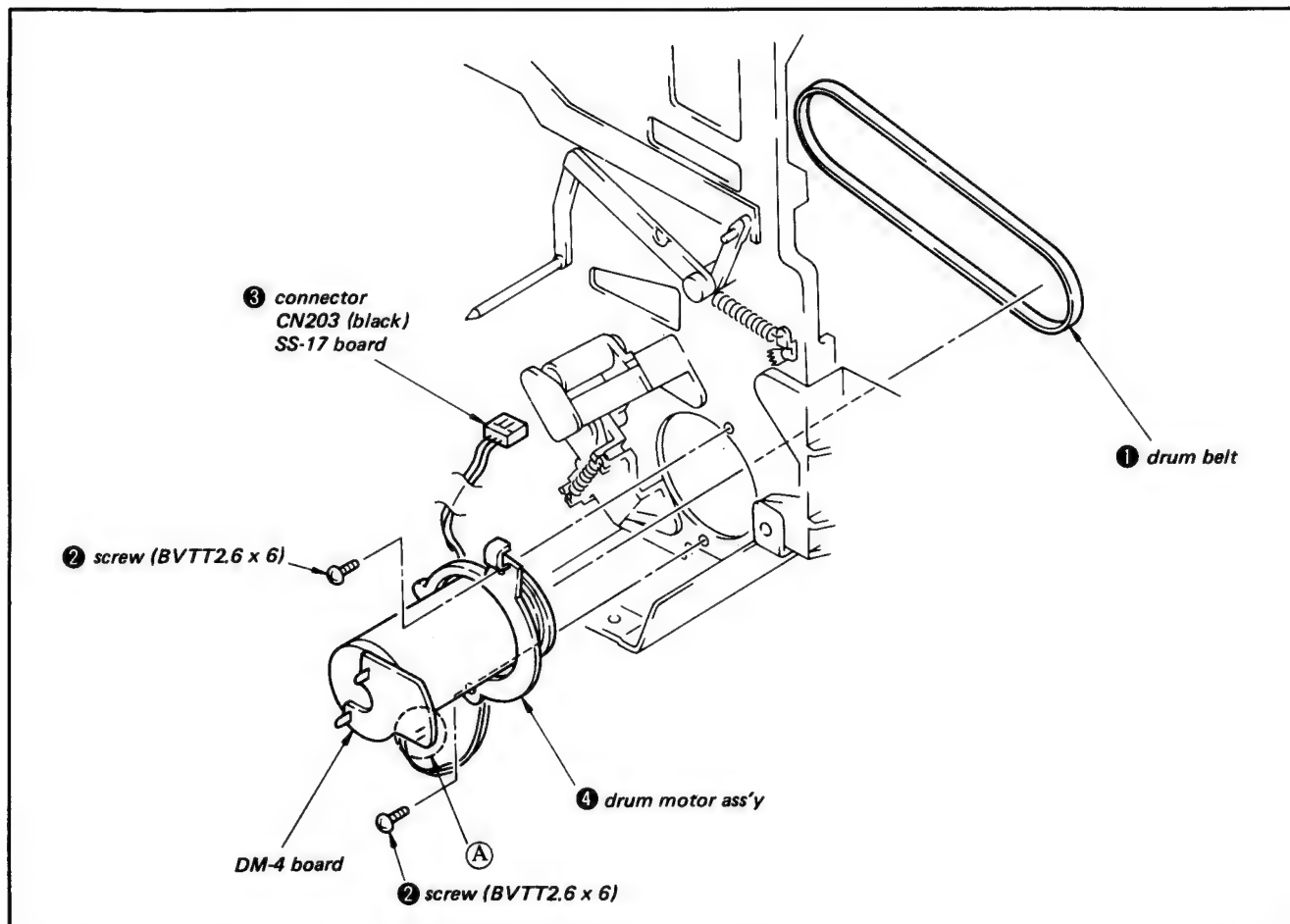


Fig. 3-14

9. Removal of FE Head Ass'y

- 1) Remove the two connectors ① or the solder (A and B sections).
- 2) Remove the screw ②.
- 3) Remove the FE head ass'y ③.

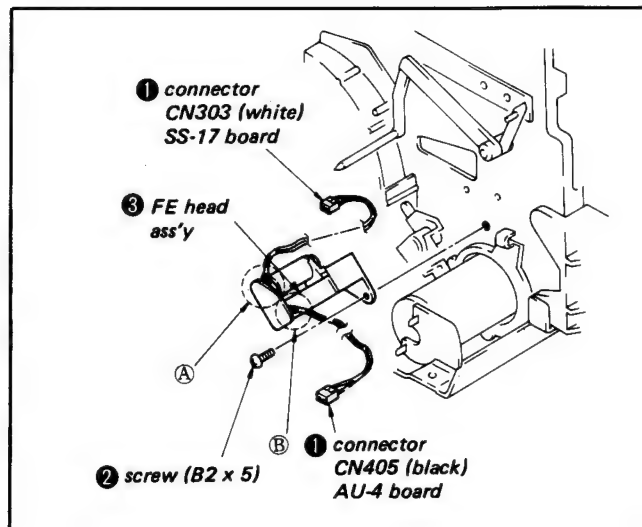


Fig. 3-15

10. Removal of AC Head Ass'y

- When removing or replacing this unit, perform the "audio height adjustment" and the "audio azimuth adjustment".

1) Remove the guide adjustment nut ①.

Note: Take care not to lose the 3φ washer.

2) Remove the solder on the lead line.

3) Remove the AC head ②.

Note: Take care not to lose the adjustment spring.

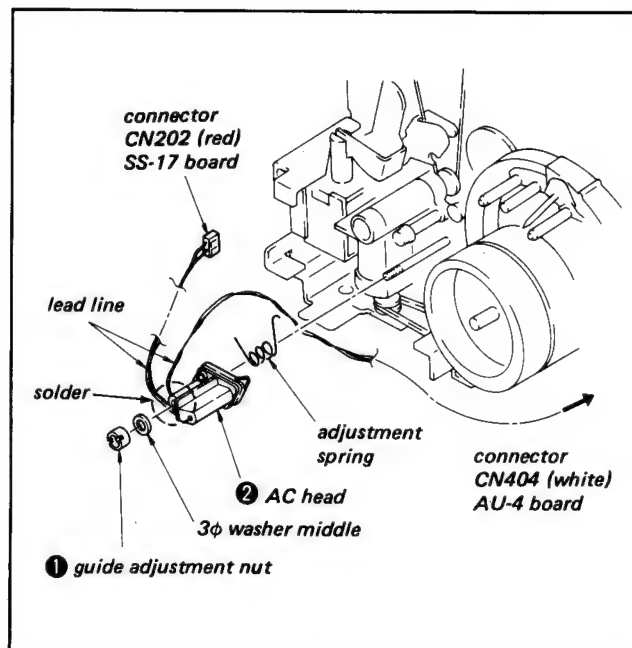


Fig. 3-16

11. Removal of Capstan Flywheel Ass'y

1) Remove the capstan belt ①.

2) Remove the screw ②.

3) Remove the thrust retainer plate ③.

4) Remove the flywheel ④.

Note: Take care not to lose the two oil seal rings (c).

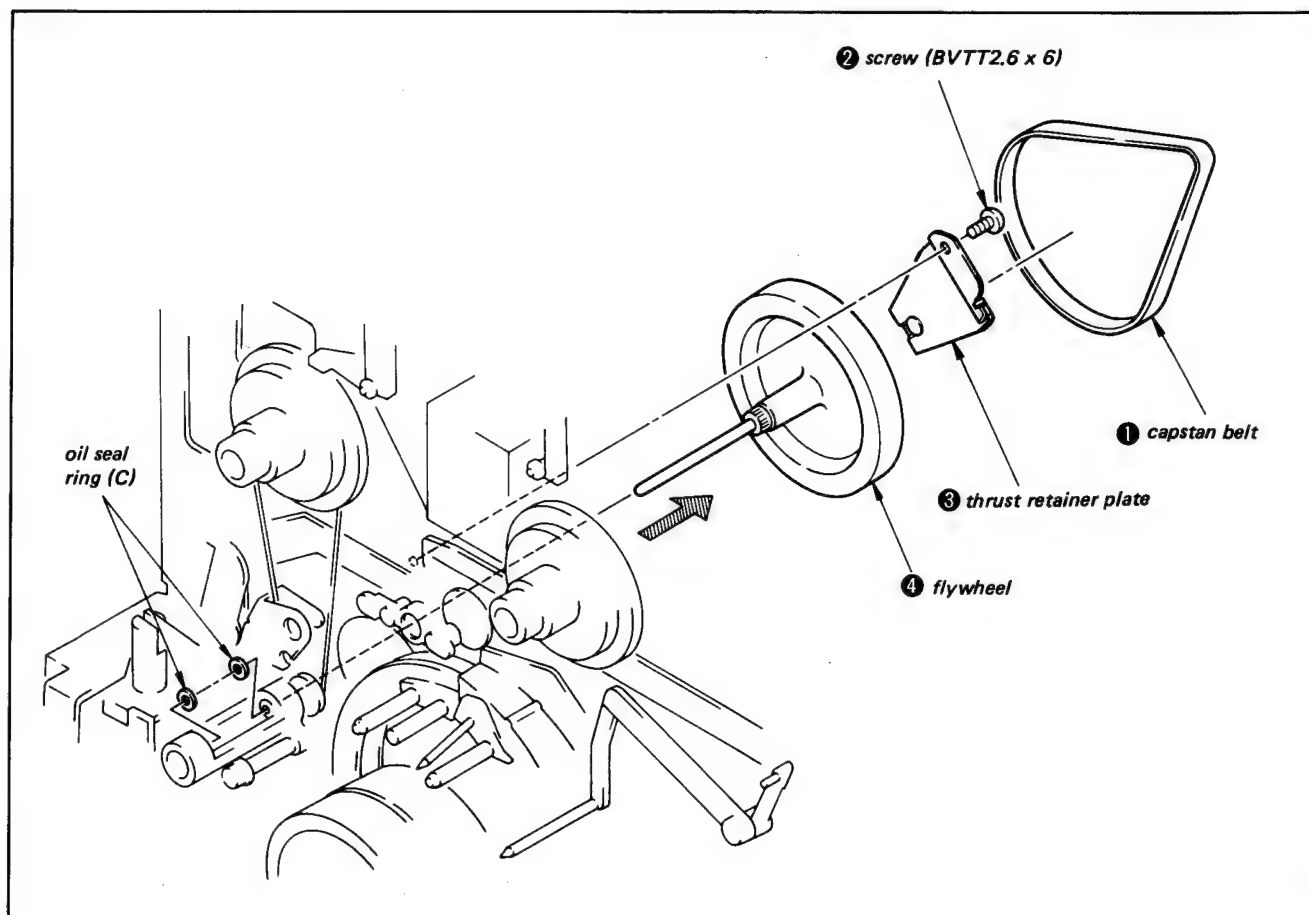


Fig. 3-17

12. Removal of Capstan Bearing Block Ass'y

- When removing or replacing this unit, check the "tape path".

- 1) Remove the three screws ❶.
- 2) Remove the capstan bearing block ass'y.

[Precautions to be taken on installation]

Press in the clockwise direction, then tighten the screws.

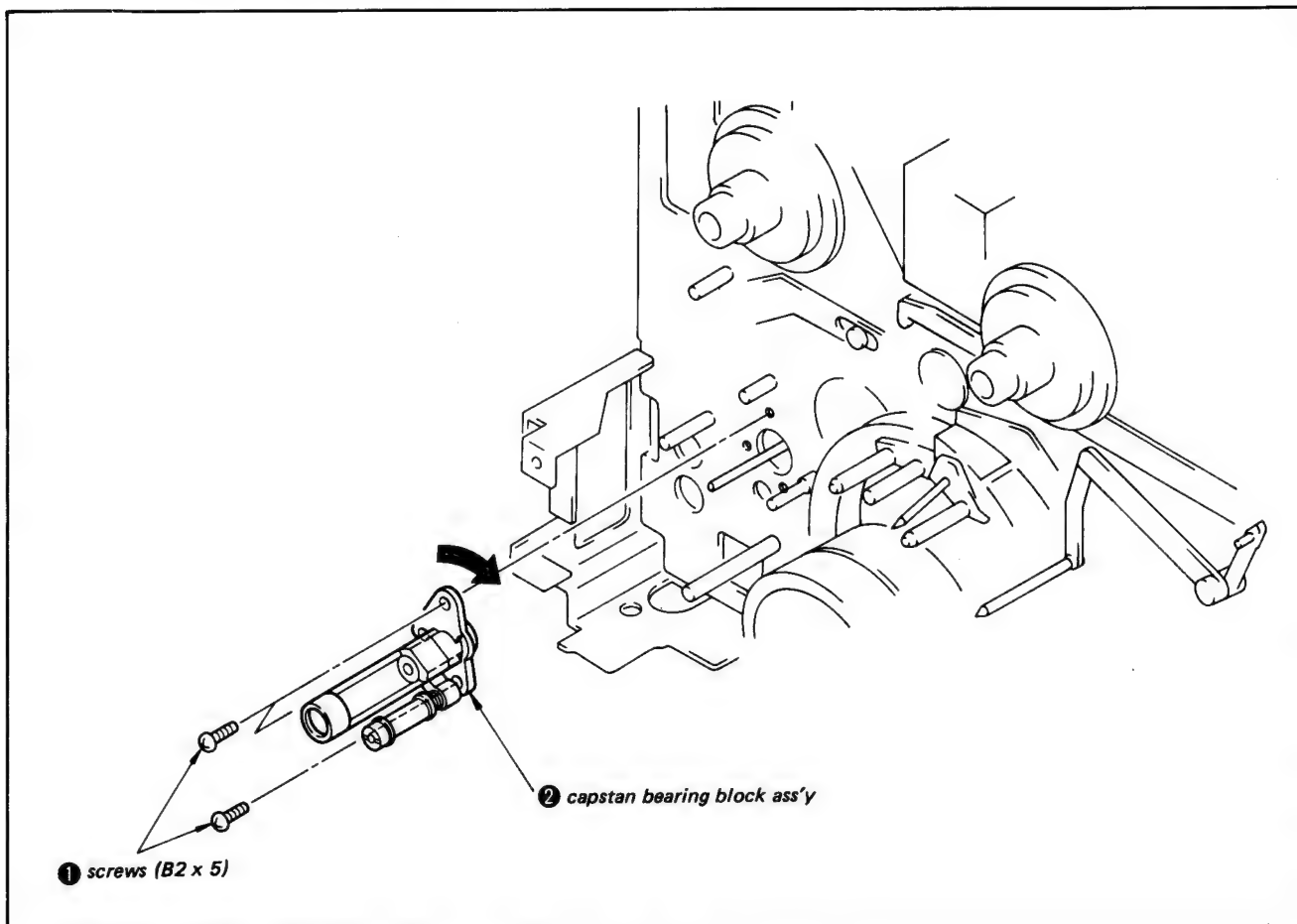


Fig. 3-18

13. Removal of TG-1 Base Block Ass'y

- When removing or replacing this unit, check the "tape path".

- 1) Remove the screw ❶.
- 2) Remove the TG-1 base block ass'y.

[Precaution to be taken on installation]

After installation, run an actual tape, equalize the vertical tape tension between No. 2 guide and No. 3 guide, and align the TG-1 base block ass'y ❷ position by turning in the direction of the arrow.

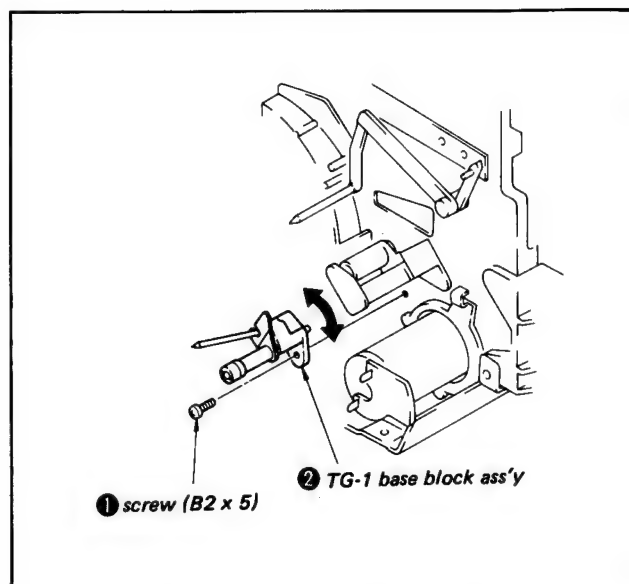


Fig. 3-19

14. Removal of Tension Regulator Band Ass'y

- When removing or replacing this unit, perform the "tension regulator lever position adjustment" and the "FWD back tension adjustment".

- 1) Remove the screw ①.
- 2) Remove the tension spring ②.
- 3) Remove the stopper washer (2.3) ③.
- 4) Remove the tension regulator arm ④.
- 5) Remove the tension regulator arm from the tension regulator band ⑤.

Note: Take care not to lose the washer.

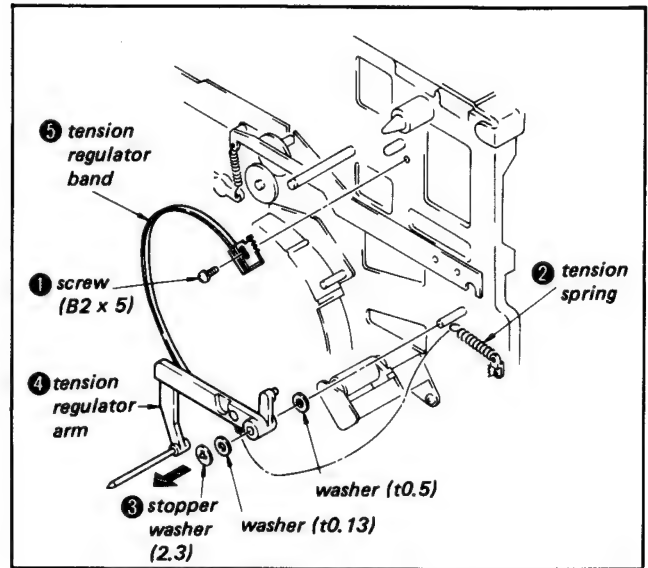


Fig. 3-20

15. Removal of Drum Ass'y

- When removing or replacing this unit, check the "tape path".

- 1) Remove the drum belt ①.
- 2) Pull out the two connectors ②.
- 3) Remove the two screws ③.
- 4) Remove the drum ass'y ④.

Note: Because there are cases where a drum spacer is also inserted, care should be taken not to

lose it. Also, when installing and replacing the drum ass'y, this spacer should be properly installed.

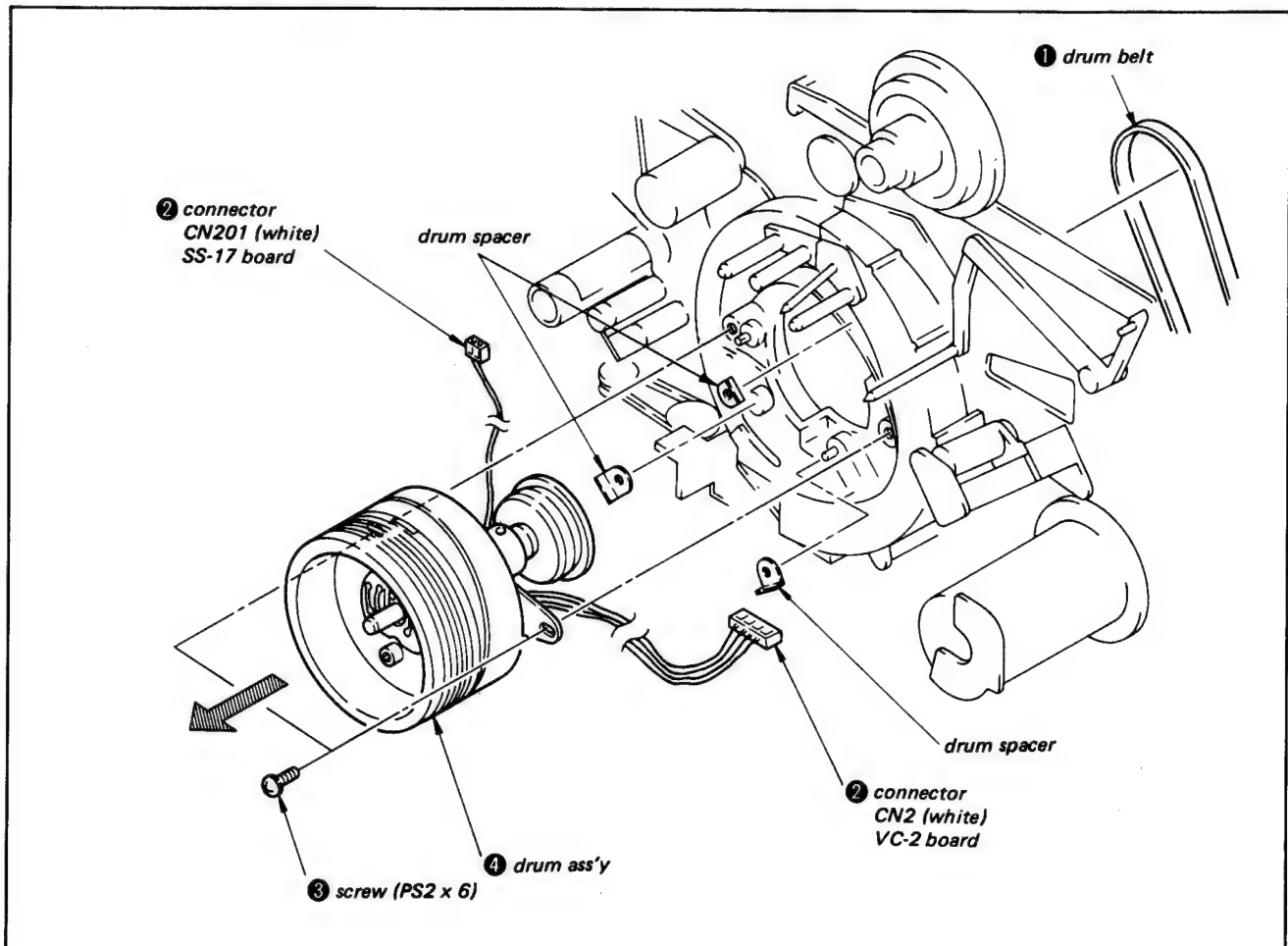


Fig. 3-21

16. Removal of Upper Drum (Rotary Drum)

- When removing or replacing this unit, check the "tape path". and perform an "angle ratio alignment".

1) Remove the hexagon hole bolt.

Note: Take care not to lose the two washers.

2) Remove the solder from the four enamel wires.

Note: Do not remove the solder from the vinyl wire.

3) Remove the upper drum ②.

Note: When removing the upper drum, leave the lower drum in place as far as possible, and take care not to disrupt the tape path.

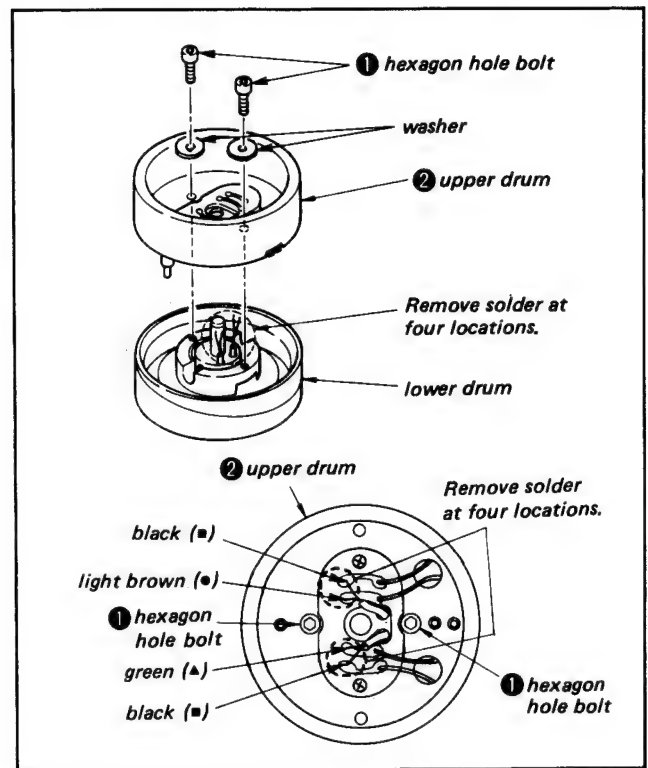


Fig. 3-22

17. Removal of Threading Guides (S-1), (S-2)

1) Remove the two screws ①.

2) Remove the threading guide (S-2) ②.

3) Remove the two screws ③.

4) Remove the threading guide (S-1) ④.

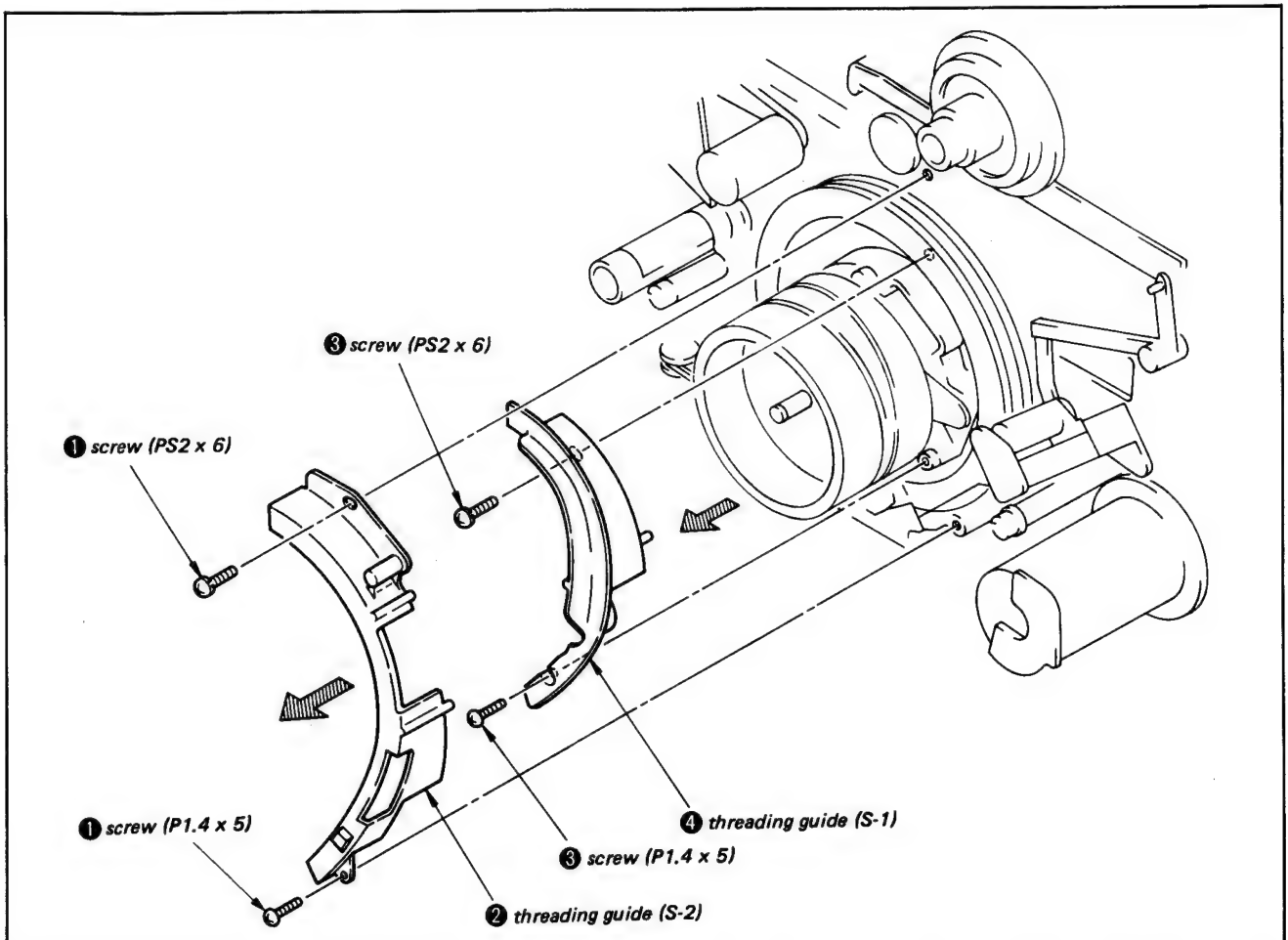


Fig. 3-23

18. Removal of Loading Rings (S), (T)

- When removing or replacing this unit, perform the "loading ring (S), (T) location adjustment" and the "pinch roller position adjustment".

- 1) Remove the four screws ①.
- 2) Remove the DEW condensation sensor ②.
- 3) Remove the drum base ③.
- 4) Remove the two stopper washers ④.
- 5) Remove the ring guide roller (A) ⑤ (two places).
- 6) Remove the loading ring (T) ⑥ in the direction of the arrow (B), while pressing it in the direction of the arrow (A).

- * Remove the loading rings (S), and (T) without removing the ring guide rollers (three places).

- 7) Remove the ring guide roller (B) ⑦.
- 8) Remove the ring guide roller (D) ⑧.
- 9) Remove the loading ring (S) ⑨ in the direction of the arrow (B), while pressing it in the direction of the arrow (C).
- 10) It is unnecessary to remove the ring guide roller (C) ⑩ and the two washers, but care should be taken that they are not lost.

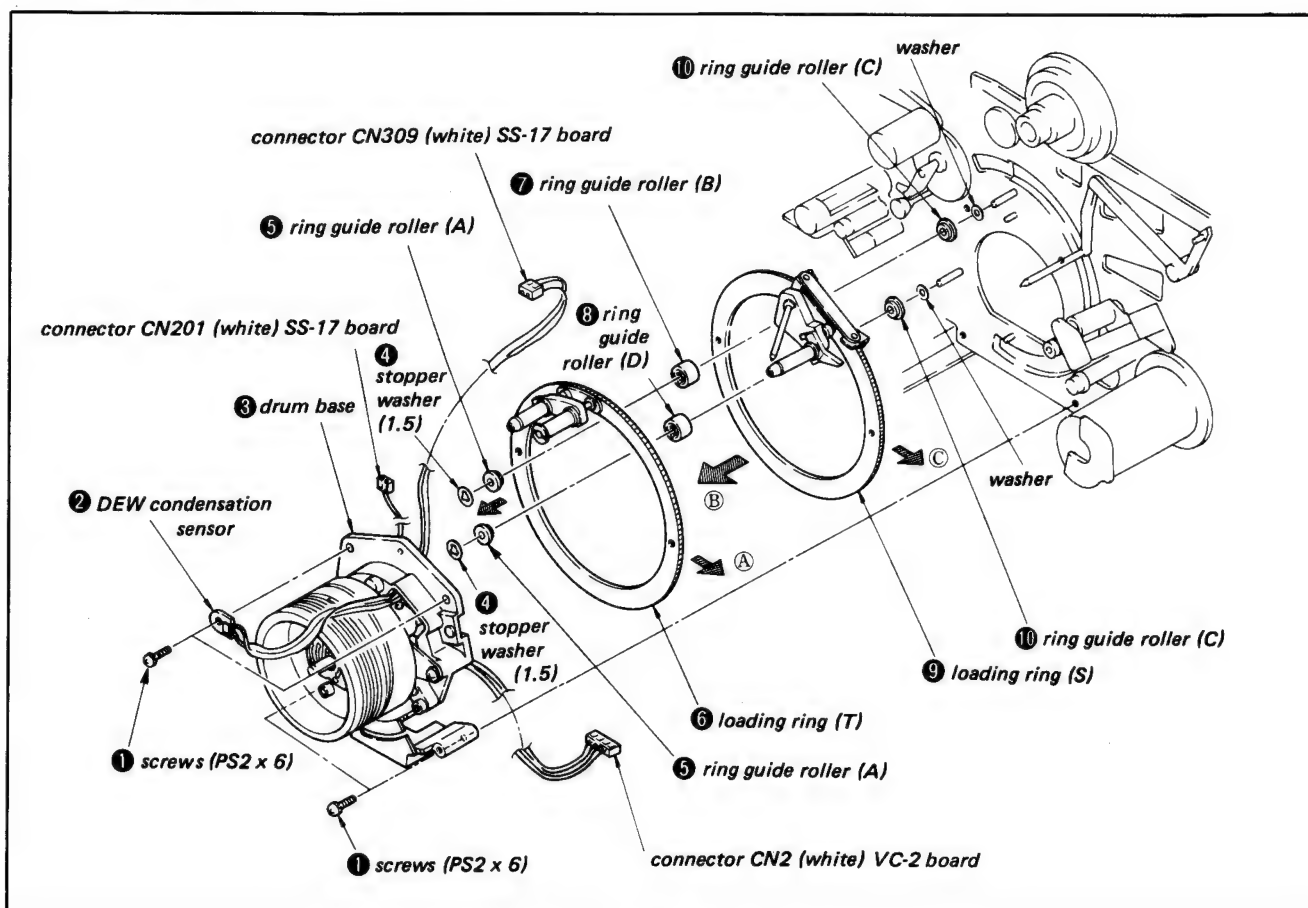


Fig. 3-24

19. Removal of TG-4 Base Block Ass'y

- When removing or replacing this unit, check the "tape path".

- 1) Remove the poly-washer (1.2) ①.
- 2) Remove the TG-4 base plate (B) ②.
- 3) Remove the poly-washer (1.2) ③.
- 4) Remove the TG-4 base block ass'y ④.

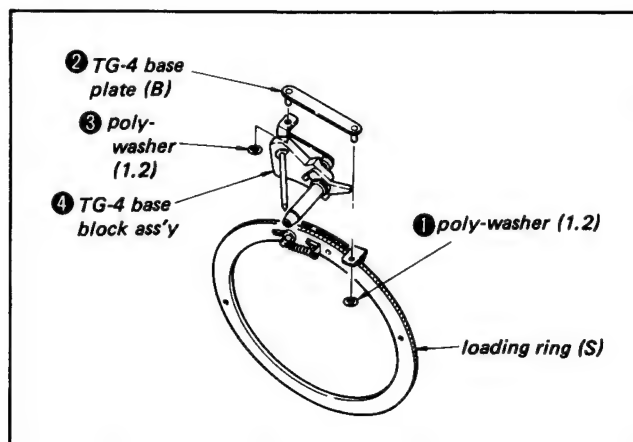


Fig. 3-25

20. Removal of TG-5 Base Block Ass'y

- When removing or replacing this unit, check the "tape path".

- 1) Remove the tension spring ① from (A) section.
- 2) Remove the stopper washer ②.
- 3) Remove the TG-5 base block ass'y ③.

Note: Take care not to lose the TG-5 base poly-slider.

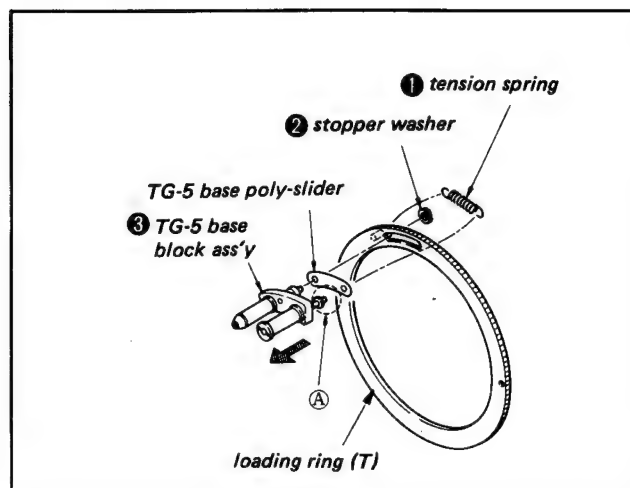


Fig. 3-26

21. Removal of Midway Pulley (P) and Relay Pulley Ass'y

[Removal of Midway Pulley (P)]

- When the relay pulley has been replaced, perform the "tape speed alignment".

- 1) Remove the relay belt ①.
- 2) Loosen the set-sct hexagon screw ② and remove the midway pulley (P).

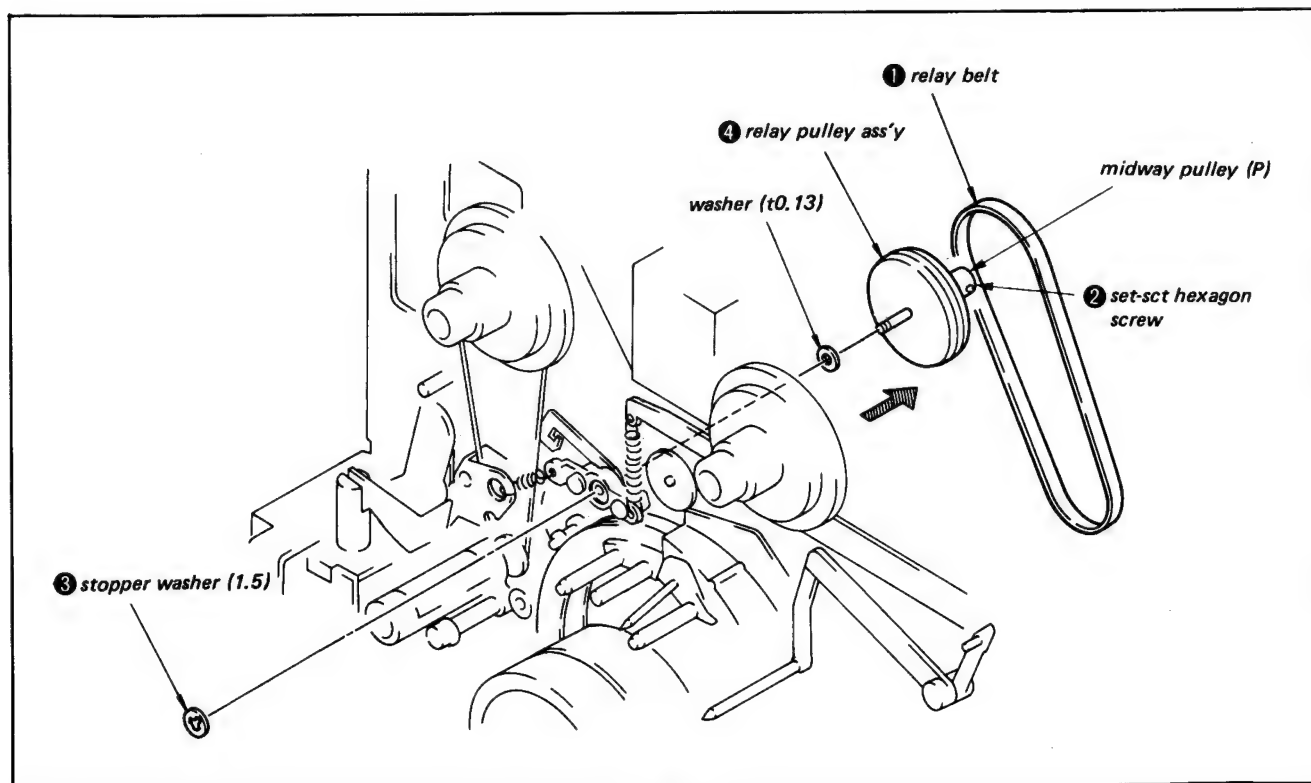


Fig. 3-27

[Removal of Relay Pulley Ass'y]

- When the midway pulley (P) has been replaced, perform the "tape speed alignment".

- 1) Remove the relay belt ①.
- 2) Remove the stopper washer (1.5) ③.
- 3) Remove the relay pulley ass'y ④.

3-3-2. Mechanical Alignment

1. Adjustment of Loading Motor Pulley Opening

- 1) Adjust the opening between the loading motor pulley ① and the motor case ② to 3mm.

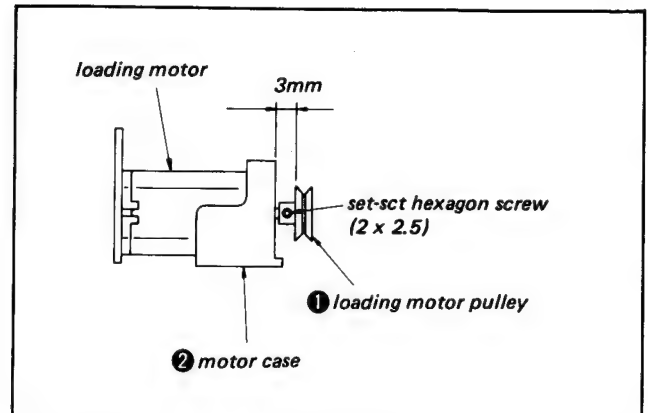


Fig. 3-28

2. Adjustment of Drum Motor Pulley Opening

- 1) Adjust the opening between the drum motor pulley ① and the drum motor bracket ② to 3mm.

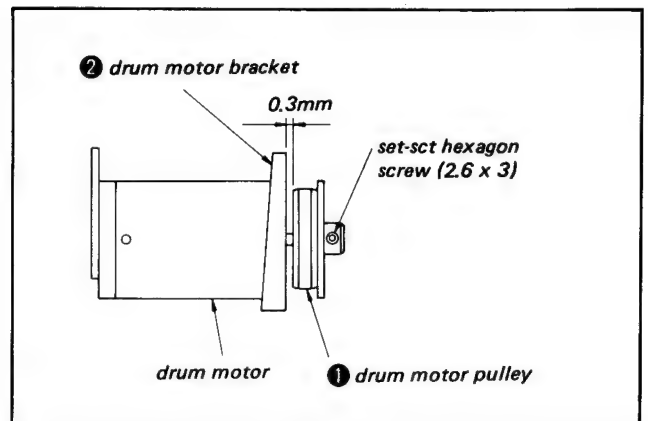


Fig. 3-29

3. Adjustment of the Position of the Loading Ring (S), (T)

- When making this adjustment, check the "pinch roller position adjustment".

- 1) Secure the loading gear (S) ① with the stopper washer (1.5) ②.
- 2) Put the loading rings (S) ③ and (T) ④ in threading status.
- 3) Line up the loading rings (S) and (T) with the positioning holes in the mechanical chassis.
- 4) Engage the loading gear (T) ⑤, and secure it with the stopper washer (1.5) ⑥.

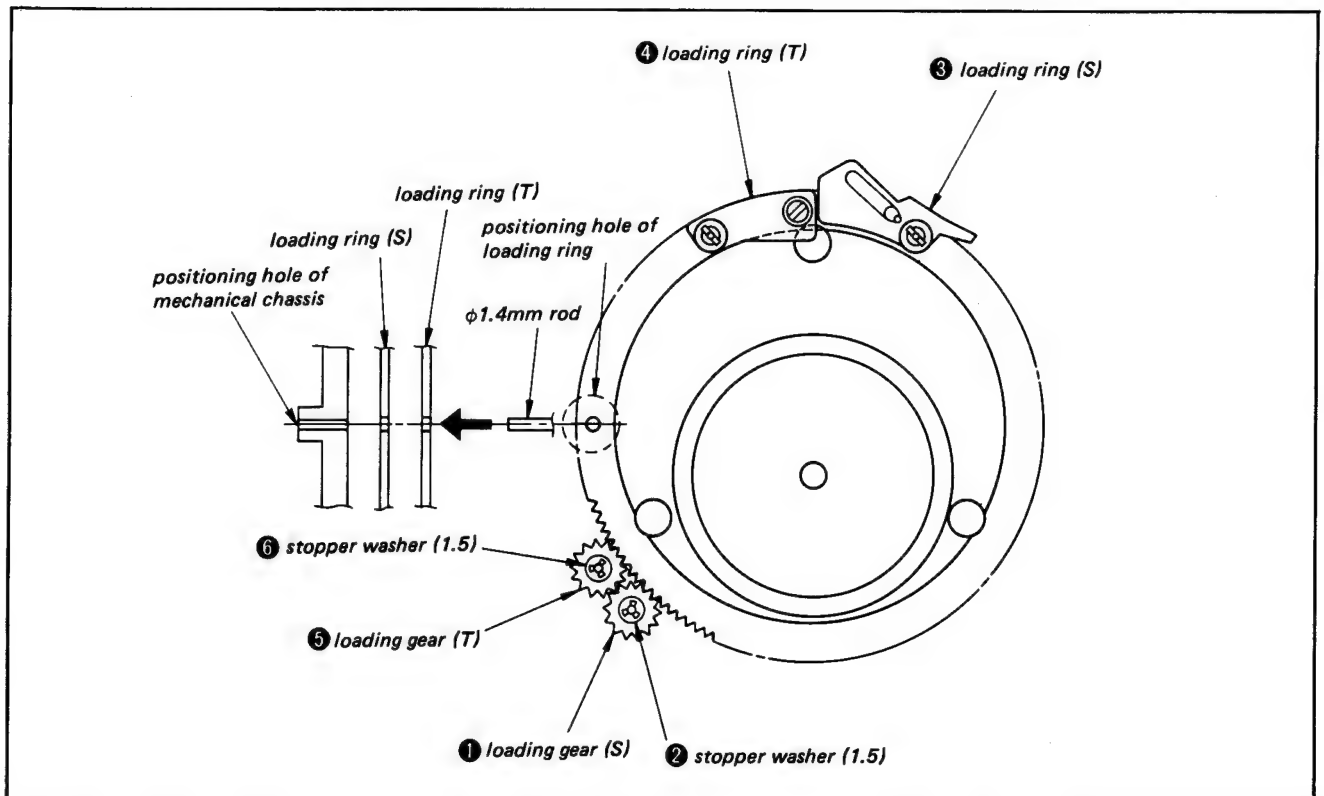


Fig. 3-30

4. Adjustment of the Position of the Driving Gears (A), (B)

- 1) Put in threading status and line up the loading ring positioning holes.
- 2) Press the PT function lever ① in the direction of the arrow and line up the mechanical chassis and

PT function lever ① positioning holes, then secure the PT function lever by inserting the 1.4mm diam rod.

- 3) Engage the driving gears (A) ② and (B) ③ as indicated in the drawing.

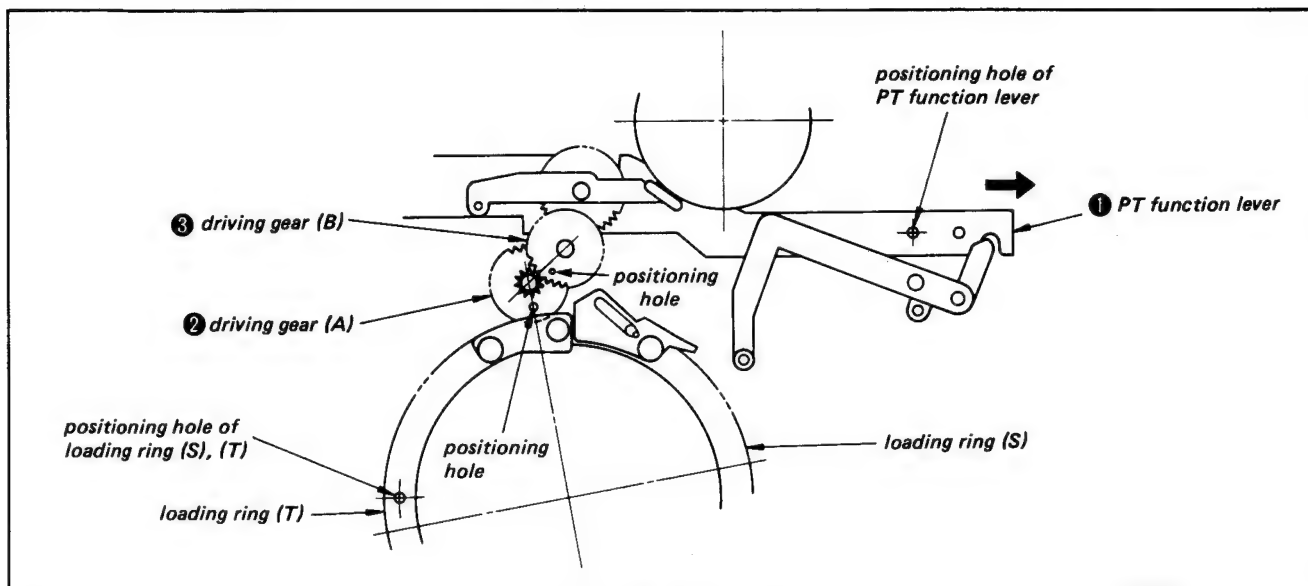


Fig. 3-31

5. Adjustment of the Position of the Pinch Solenoid

- 1) Loosen the two screws ①.
- 2) Press the plunger ③ of the pinch solenoid ② in the direction of arrow ④.
- 3) At that time, move the PS bracket ⑥ in the direction of arrow ⑤, so that the opening between the pinch press lever ④ and the pinch press lever (D) ⑤ becomes 0.5mm.
- 4) Tighten the two screws ①.
- 5) Turn on the power, press the REC START/STOP button, and turn the pinch solenoid ON/OFF, and confirm that the opening is 0.5mm.

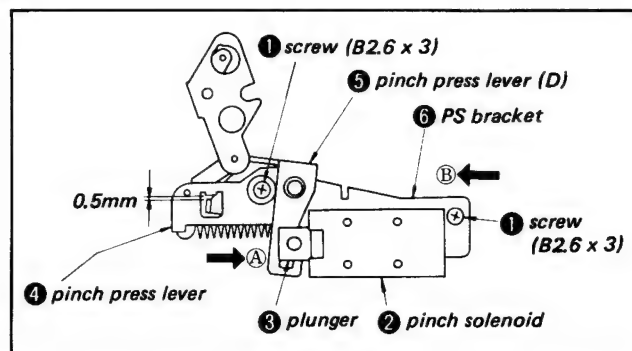


Fig. 3-32

6. Adjustment of the Position of the Brake Solenoid

- 1) Press the plunger of the brake solenoid in the direction of the arrow ①. First set the brake rubber to touch the S reel and T reel, then press the plunger further. Next adjust the brake solenoid position in the ② direction and set with the screws ③.
- 2) With the plunger ② pulled in the direction of the arrow ③, adjust the opening between the brake rubber ④ and the S reel and T reel to 0.5 to 1.0mm.

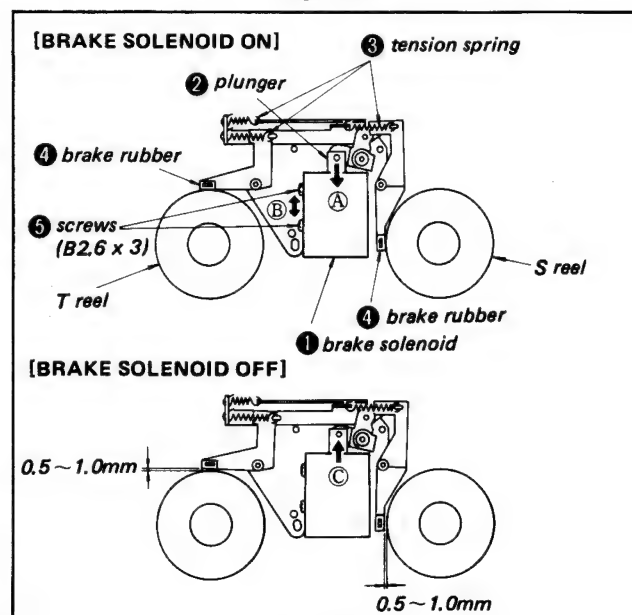


Fig. 3-33

7. Adjustment of the Position of the Pinch Roller

- 1) Turn on the power, and after completing the threading operation, press the REC START/STOP button two or three times to turn the pinch solenoid ON and OFF.

Note: If threading is done manually, the final threaded position will be inaccurate. Therefore, threading should always be carried out with the power applied, after which the pinch solenoid should be turned ON and OFF.

- 2) Loosen the screw ①, and adjust the opening between the pinch roller ② and the capstan shaft ③ to 0.5mm.
- 3) Depress the REC START/STOP button, and turn the pinch solenoid ON and OFF, to confirm that the opening is 0.5mm.

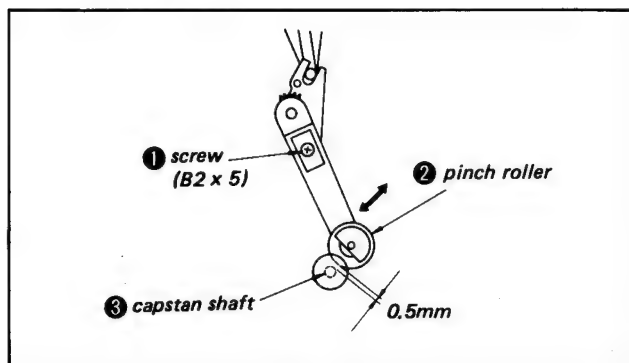


Fig. 3-34

8. Adjustment of the Position of the Tension Regulator Arm

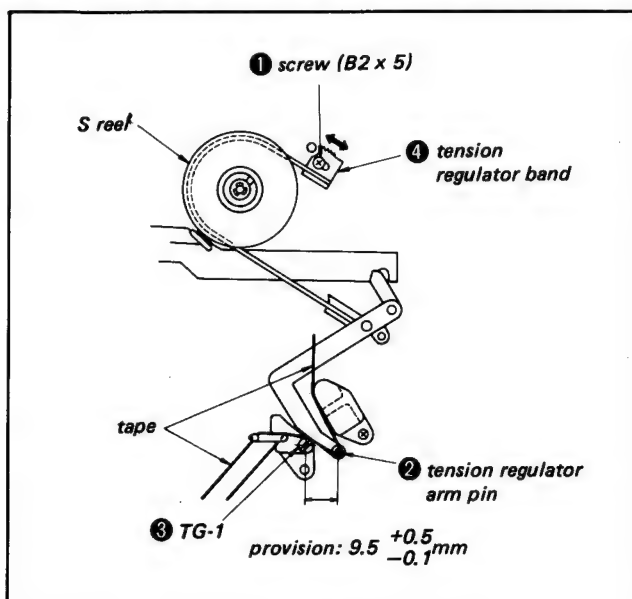


Fig. 3-35

- 1) Apply power, and record without a cassette.
- 2) Loosen the screw ①, adjust the center-to-center distance of the tension regulator arm pin ② and

TG-1 ③ to about 10.5mm, and temporarily stop the tension regulator band ④.

- 3) Insert a cassette and start to record. Confirm that the abovementioned distance is $9.5^{+0.5}_{-0.1}$ mm.
- 4) If this provision is not satisfied, readjust the tension regulator band position ④.

9. Adjustment of the FWD Back Tension

- 1) Set the reel table tension gauge ① and run the tape through at 2cm/sec.

Note: Run the tape through so that it is in contact with the outer circumference of the upper drum (rotary drum).

- 2) Loosen the screw ② and adjust the position of the spring retainer ④ with the sector type gauge (for 50g) ③ showing 35 to 40g.
- 3) Tighten the screw ②.

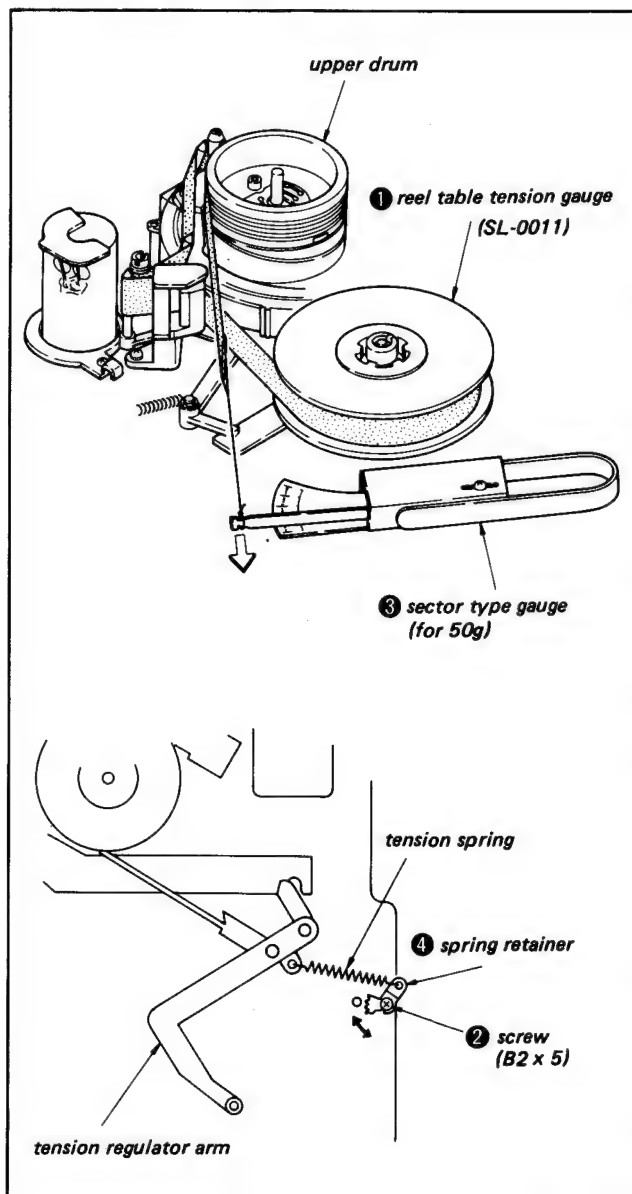


Fig. 3-36

10. Tape Speed Adjustment

This unit has only a drum servo and no capstan servo. Therefore the tape speed (2cm/sec) is determined by midway pulley (P).

Connection diagram

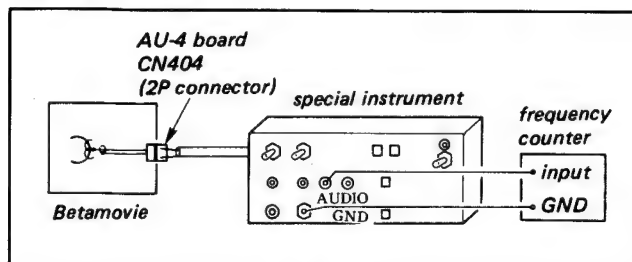


Fig. 3-37

[Adjustment method]

Mode: Playback

Signal: Alignment tape 3kHz signal

Frequency counter: Special instrument AUDIO SIG terminal

1) Playback alignment tape 3kHz (color bar).

Note: If the safety tab of the alignment tape has been removed, cover that section with tape.

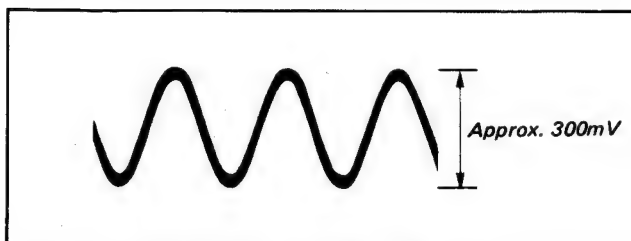
2) Correct the frequency counter value.

• Correction method

The Tape Speed Calibration Value is recorded on the alignment tape.

*For example, if this value is 0.1%, when the frequency counter shows 2,997Hz, the Speed, i.e. 2cm/sec, is correct.

*At -0.1%, 3,003Hz is displayed at the correct speed.



Special instrument AUDIO SIG terminal

Fig. 3-38

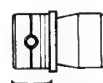
3) Replace the midway pulley (P) to obtain the corrected frequency $\pm \frac{6}{18}$ Hz.

Midway pulley (P): 3-682-740-□□ (0 to 9)
End

Figure showing diam.

Diameter (Note 1)	Number	0	1	2	3	4	5	6	7	8	9
	Code										
		Smaller ← → Larger									
	Tape speed	Slower ← → Faster									
	Remarks	The frequency changes about 7Hz for a one rank difference in diameter.									

Note 1: Diameter identification



Wide grooves and narrow grooves indicate diameter.

11. Adjustment of AC Head (Audio/CTL)

- Connect the special instrument (signal converter BMCJ-888P) and make the adjustment.

Adjustment terminology

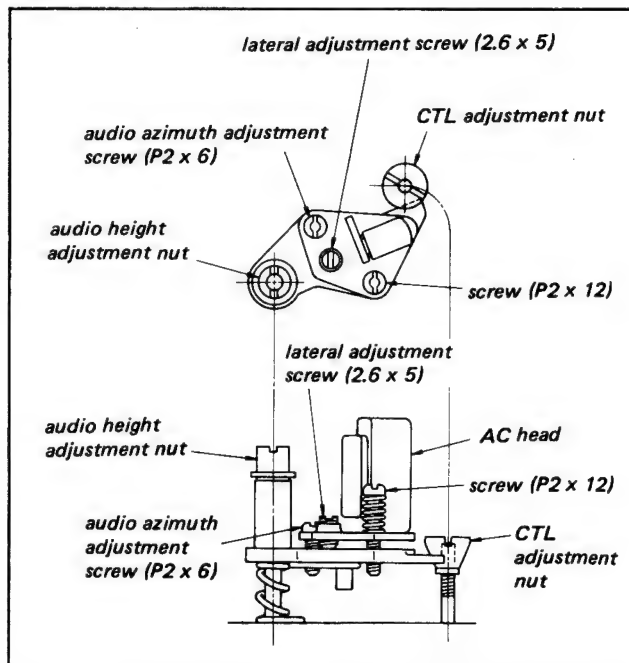
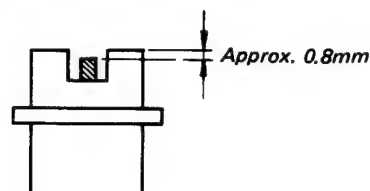


Fig. 3-39

[Height adjustment]

- 1) Turn the audio height adjustment nut and set as shown in the following diagram.



- 2) Play back the 333Hz section of the alignment tape and adjust the audio height adjustment nut to get the maximum output level.
- 3) Confirm that there is no curling in the No. 7 guide.

[Azimuth adjustment]

- 1) Play back the 5kHz section on the alignment tape and adjust the audio azimuth adjustment screw to give the maximum output level.
- 2) Run the tape for a short time to confirm that there is no extensive change in the output level.

[Lateral adjustment]

- When this adjustment is made, carry out the "height adjustment" and "azimuth adjustment".
- 1) Play back the 5kHz section on the alignment tape.
 - 2) Confirm that there is no curling in the No. 7 guide.
 - 3) Turn the lateral adjustment screw until the output level remains unchanged when pressure is applied to the tension regulator arm ① in the direction of the arrow.

Note: Adjust the lateral adjustment screw within a range of 45deg.

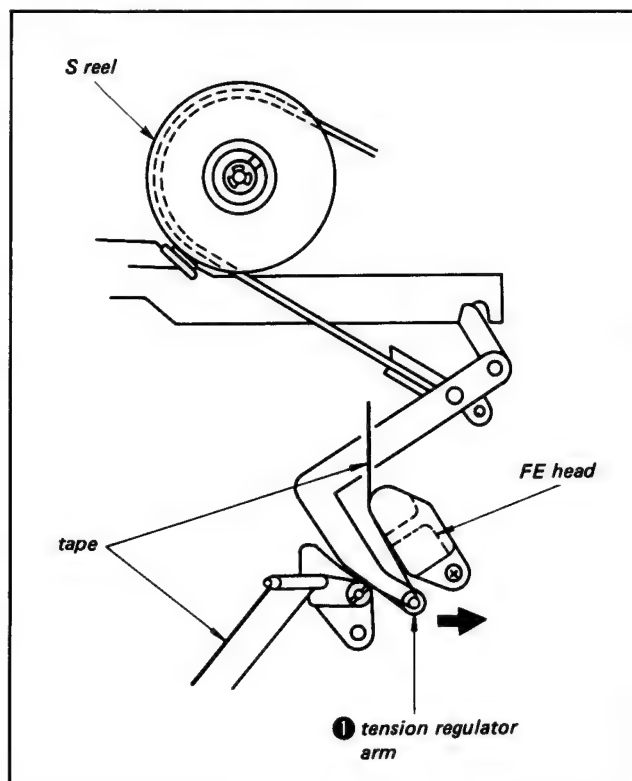


Fig. 3-40

12. Adjustment of the Position of the CTL (AC Head)

- Connect the special instrument (signal converter BMCJ-888P) and carry out the adjustment.

Adjustment terminology

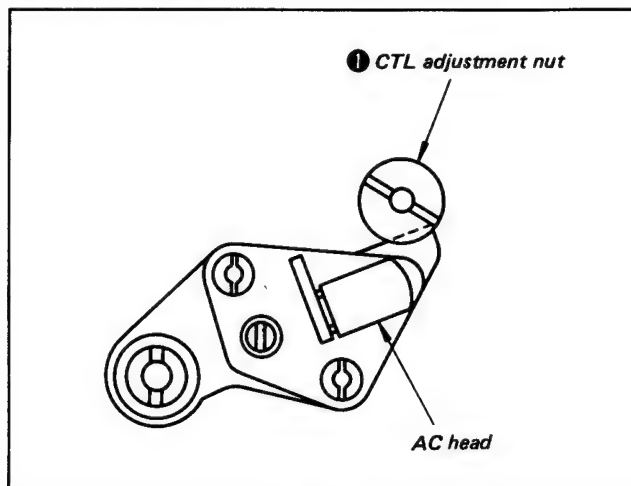


Fig. 3-41

Mode: Playback

Signal: Alignment tape tracking signal (KR5-3C is recommended)

* KR5-3C: This tape is made especially for tracking, and has a recorded time of 40min.

Oscilloscope: CH-1 RF terminal of special instrument
CH-2 TP204 (CTL signal) of SS-17 board

[Adjustment method]

- 1) Adjust the CTL adjustment nut until the CTL signal and phase are as shown in the following diagram at maximum RF output.

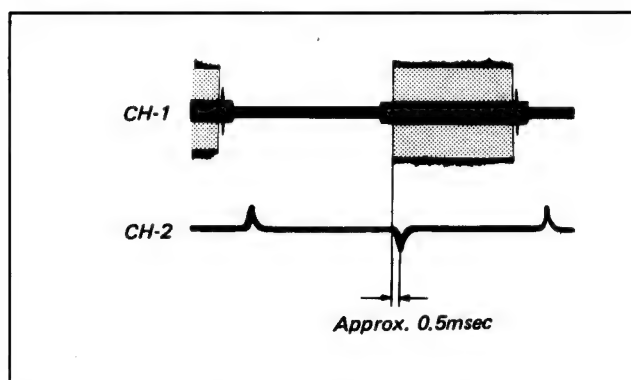


Fig. 3-42

- 2) Confirm that there is no noise, even when the TRACKING knob on the playback VTR is rotated $\pm 30\text{deg}$, when the tape being played back on the VTR is a 100% white signal recording made on the Betamovie.

- 3) If noise occurs, switch from the Betamovie recording → playback on the VTR → recording after turning the CTL adjusting nut on the Betamovie → playback on the VTR.

13. Checking FWD Torque

To measure, FWD torque, set the measuring cassette (SL-0003C) and confirm that the T-reel indicator reaches $40 \begin{smallmatrix} +10 \\ -14 \end{smallmatrix} \text{g}\cdot\text{cm}$.

- * If the standard is not met, replace the T reel and check that the value falls within the standards.

3-4. TAPE PATH ADJUSTMENT

This adjustment significantly effects the picture quality in each mode and the interchangeability of the tape, so great care should be taken in carrying it out.

3-4-1. Tracking Adjustment

1. Preparation

- 1) Connect the special instrument (signal converter BMCJ-888P). (See page 4. Fig. 1-3)

- 2) Check the tape speed

This unit does not have a playback servo, so tracking failures can occur periodically, and the RF output level changes. For this reason, the conventional method of adjusting with a TRACKING knob to set at $2/3$ of the maximum output level cannot be applied. Therefore, adjustment is made during a change in the RF output level, and it is necessary to first check whether the adjustment is made during an increase or a decrease.

[Checking method]

While looking at the special monitor (converted to $f_H=18.75\text{kHz}$), or while looking at the oscilloscope connected to the RF terminal of the special instrument (BMCJ-888P), touch the capstan flywheel with the fingertips, and change the RF output level.

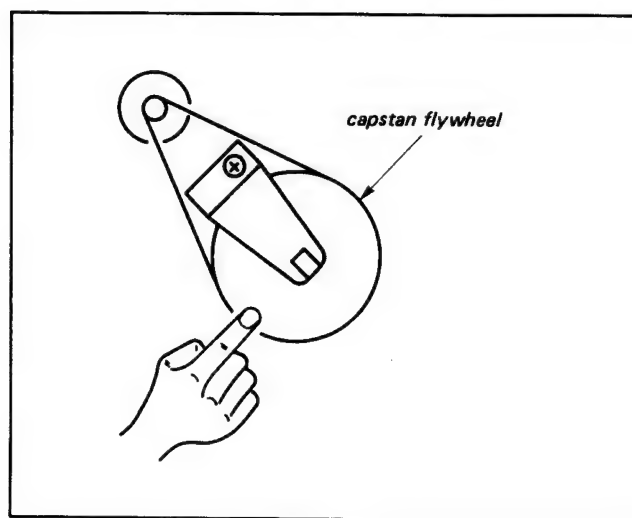


Fig. 3-43

Direction of change	Tape Speed	Adjustment made
Same direction	Slow	During increase
Reverse direction	Fast	During decrease

The same direction is defined as the condition when:

- During an increase, when touching the flywheel, the output level increases.
- During a decrease, when touching the flywheel, the output level decreases.

The reverse direction is defined as the condition when:

- During an increase, when touching the flywheel, the output level decreases.
- During a decrease, when touching the flywheel, the output level increases.
- Using the above method, check the tape speed to determine whether the RF output level should be increased or decreased.

3) Check the adjustment level

Check the maximum value of the RF output level, and adjust to 2/3, or check that level (noting it).

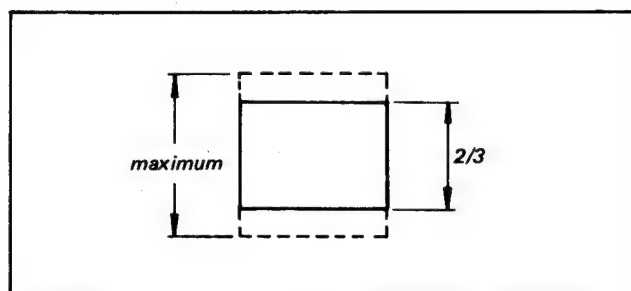


Fig. 3-44

2. Adjustment method

Diagram showing adjustment guide arrangement

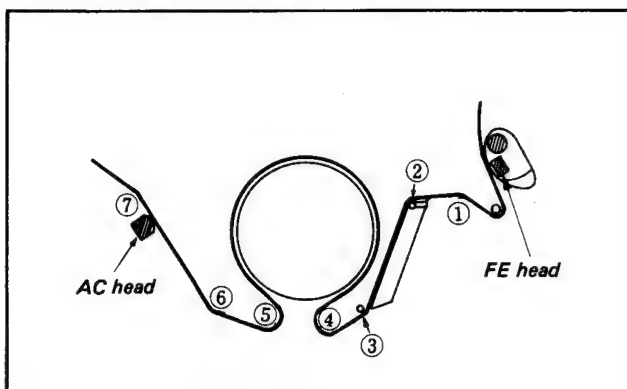


Fig. 3-45

The tape guides are numbered from No. 1 to No. 7. The role of each is as follows.

Guide No.	Role
No. 1 guide	Vertical regulation
No. 2 & No. 3 guides	Fixed guides (no regulation)
No. 4 & No. 5 guide	Upward regulation
No. 6 guide	Downward regulation
No. 7 guide	Upward regulation

[Rough adjustment]

First make an approximate alignment at the tape entrance and exit side.

- 1) Rotate No. 6 & No. 7 guides to create a space of 0.2mm between the guides and the tape.
- 2) Check that there is tape at the lighted section of the FE head (core section).

If not set No. 1 guide according to Fig. 3-46.

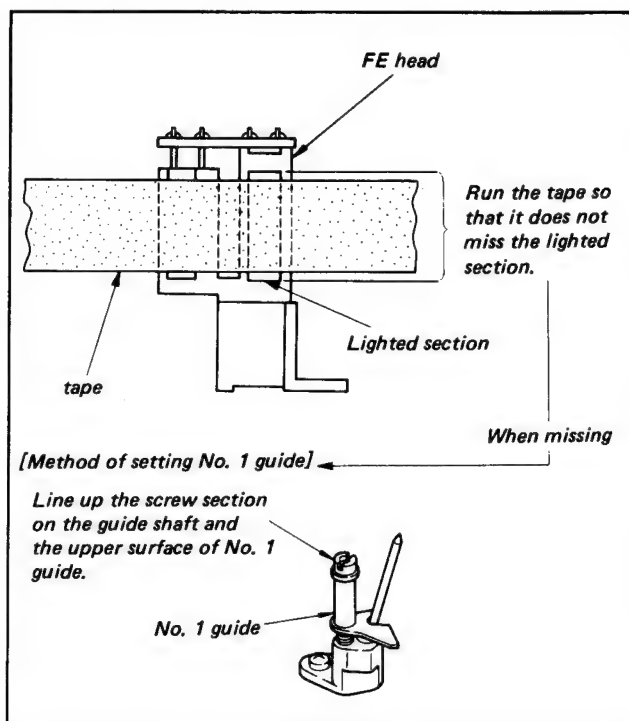


Fig. 3-46

[Fine adjustment]

Entrance side adjustment

- 1) Make the tape as flat as possible at No. 1 and No. 4 guides.
- 2) Check that there is tape at the lighted section of the FE head (core section).
- 3) Any curl at No. 1 guide and No. 4 guide must be less than 0.5mm.
- 4) Set No. 4 guide with the lock screw.

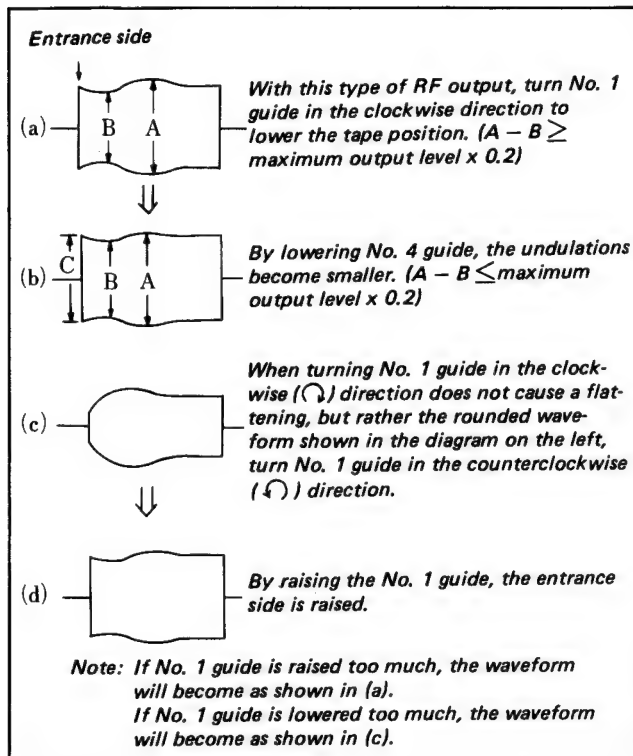


Fig. 3-47

[Exit side adjustment]

- 1) Adjust with No. 5 guide to obtain a flat or slightly sagging pattern, then set with the lock screw.
- 2) Check to see that the tape runs parallel to the upper flange of No. 5 guide.

Note: Any curl must be less than 0.5mm
If the tape does not run parallel to the upper flange, insert a drum spacer as shown in (C) of Fig. 3-50.

- 3) Make No. 6 guide parallel to the lower edge of the tape.

Note: There must be no curl.

- 4) Make No. 7 guide parallel to the upper edge of the tape.

Note: There must be no curl.

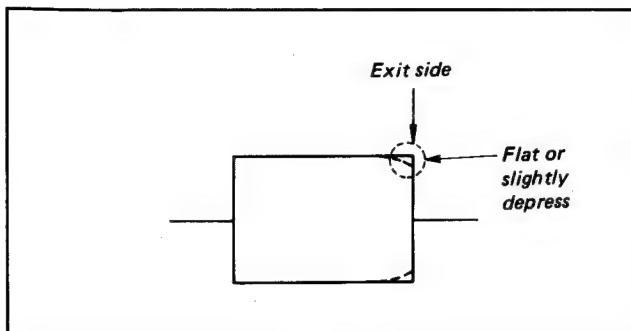


Fig. 3-48

[Standards]

Check the tape speed, and determine whether the check was made with the output level increasing or decreasing, then check at 2/3 of the maximum output level.

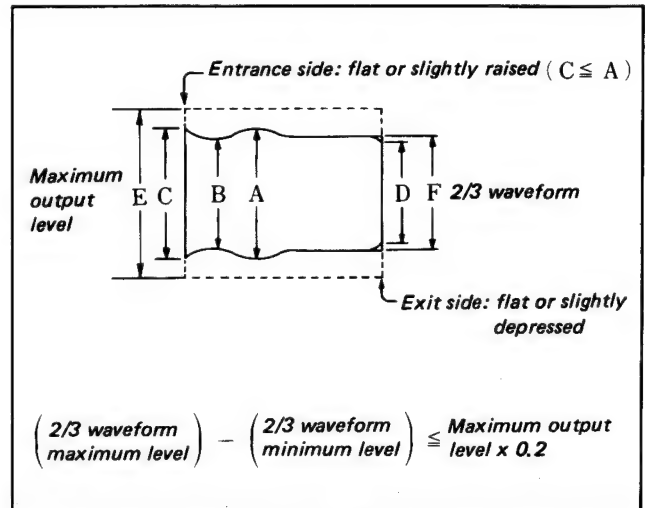


Fig. 3-49

[Outside of standards]

When standards cannot be met by adjusting only No. 1 and No. 4 guides, and No. 5 guide.

Add a drum spacer (thickness 80μ : 3-681-669-01; 40μ : 3-681-669-11) between the drum and the mechanical chassis. First use the 80μ spacer, and if this causes an inclination in the other direction, remove it and insert the 40μ spacer. A maximum of 120μ may be inserted at one position.

Diagram showing locations to insert drum spacers

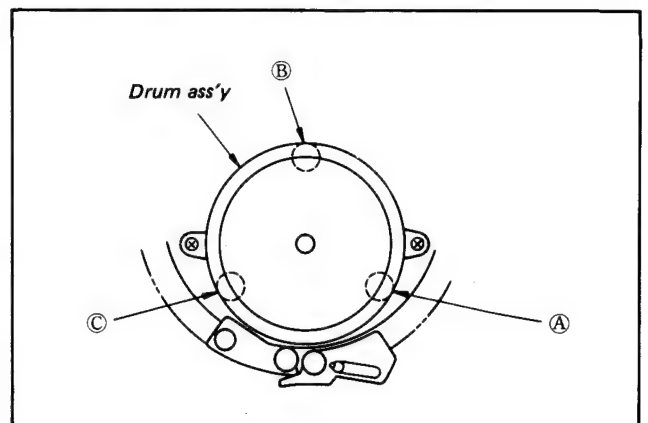


Fig. 3-50

Indications of insertion locations

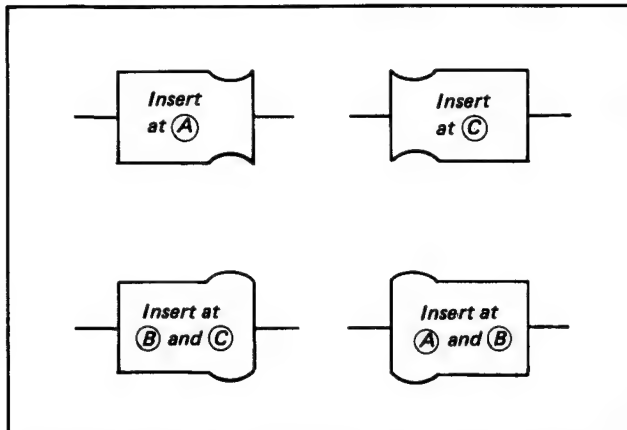


Fig. 3-51

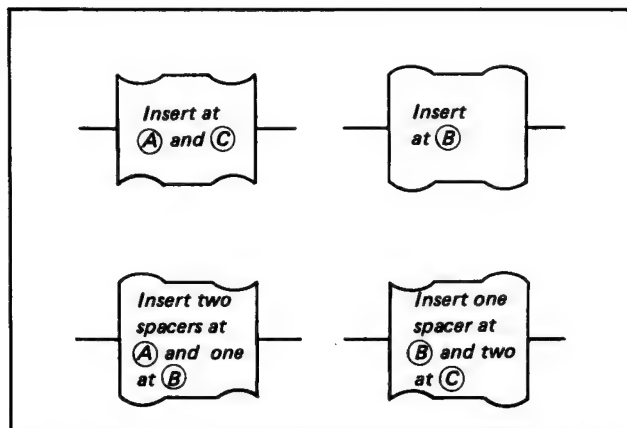


Fig. 3-52

SECTION 4 ELECTRICAL ALIGNMENT (VIDEO SECTION)

[Equipment required]

- 1) Oscilloscope: Dual-trace, bandwidth more than 10MHz with delay mode.
- 2) Frequency counter.
- 3) Digital voltmeter.
- 4) Alignment tape, type KR5-2H and KR5-3C.
- 5) Pattern box.
- 6) Audio generator.
- 7) Audio attenuator.
- 8) Audio distortion meter.
- 9) Audio level meter.
- 10) VTR (For Betamovie camera, because the VTR does not have playback or rewind functions.
- 11) Signal generator

[Preparatory setup for alignment]

The signal obtained from the camera is used in the alignment of the VTR, so the output signal must be within the specified range.

Verify the video signals by connecting the oscilloscope to TP11 (luminance signal) and TP9 (chroma signal) on the VC-2 board.

1. Connection diagram

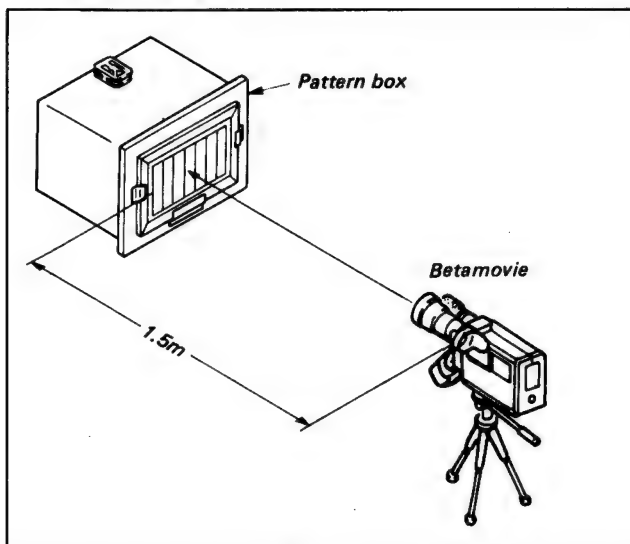


Fig. 4-1

2. Align the color bar signal on the monitor as shown in the following diagram.

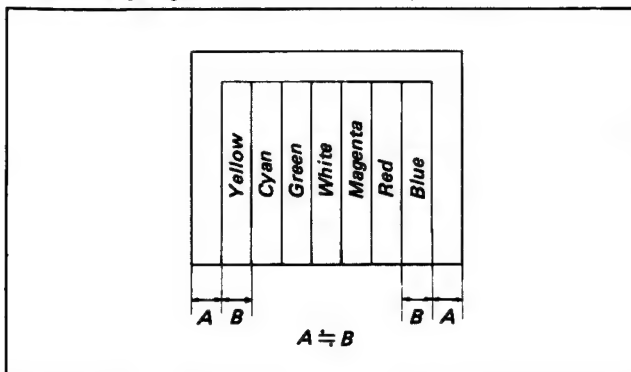


Fig. 4-2

3. Signals

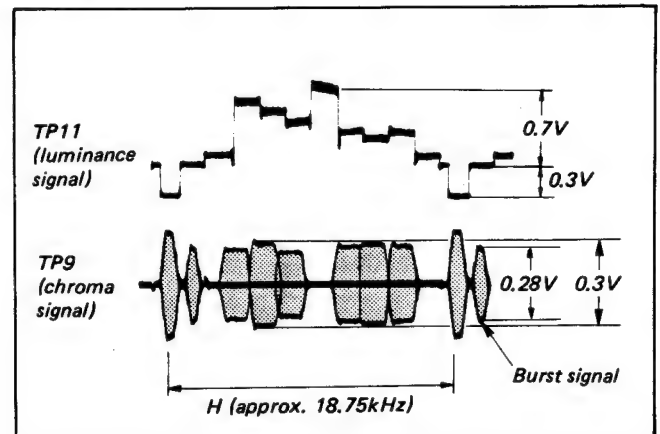


Fig. 4-3

[Method of eliminating signal from video circuit of VTR]

The luminance signal and the chroma signal supplied from the camera to the VTR via a solder bridge on the VC-2 board. To cut off signals while aligning the video circuit, remove this solder bridge.

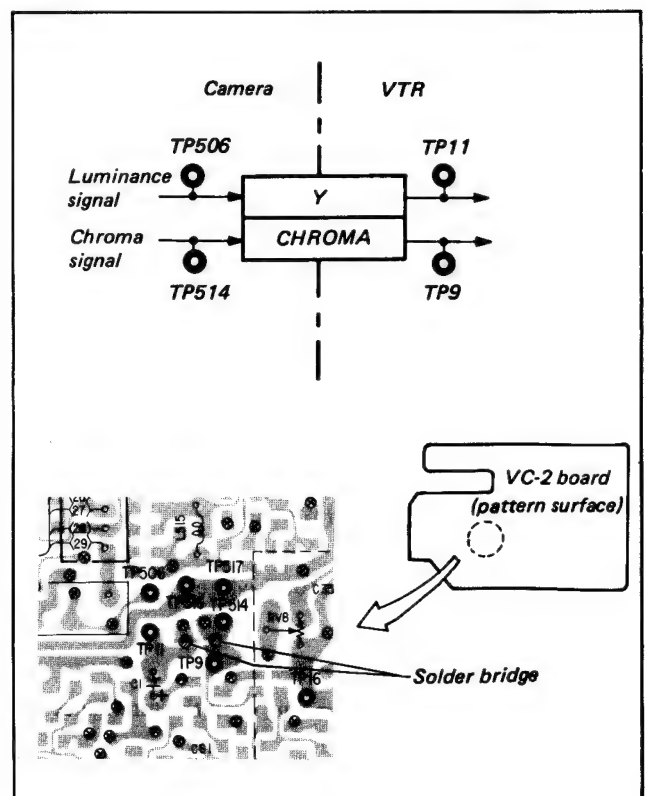


Fig. 4-4

[Alignment screwdriver]

For alignment of the semi-fixed VRs and inductances on the printed circuit boards, use the special tool supplied as illustrated in Fig. 4-5. An ordinary screwdriver is too large to adjust the VRs from the pattern side of the board. Use the metal blade of the tool to adjust VRs and trimmer capacitors.

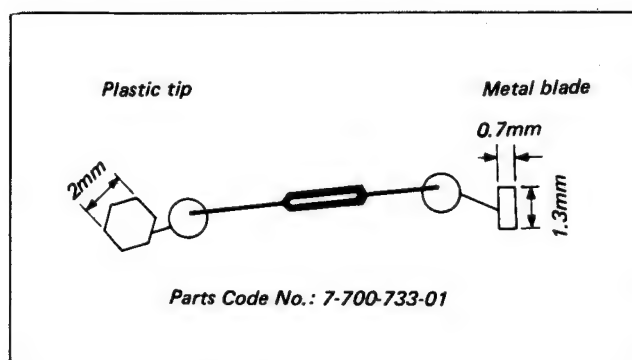


Fig. 4-5 Special alignment tool

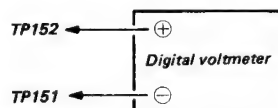
4-1. VIDEO SYSTEM ALIGNMENT

4-1-1. Compress Adjustment

Mode: Record

Signal: None (solder bridge between TP506 and TP11 removed)

Digital voltmeter:



[Adjustment method]

- 1) Adjust to $0.3 \pm 0.01V$ with RV152.

4-1-2. Y-FM Deviation Adjustment

Mode: Record

Signal: Pattern box (100% white)

Oscilloscope: TP11

[Adjustment method]

- 1) Turn the Betamovie zoom ring until the luminance signal on TP11 is $1.2V_{p-p}$.

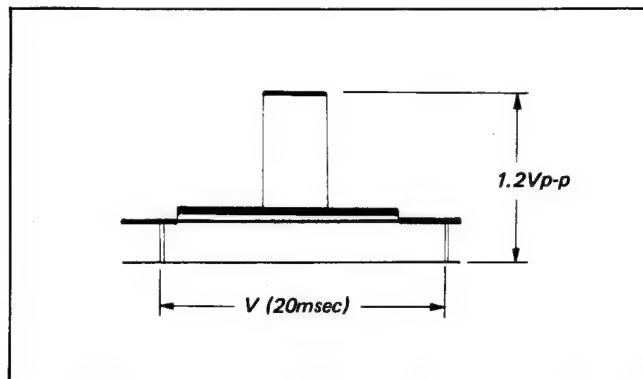


Fig. 4-6

- 2) Connect the oscilloscope to TP15.
- 3) Adjust RV156 until the signal is as shown in the following diagram.

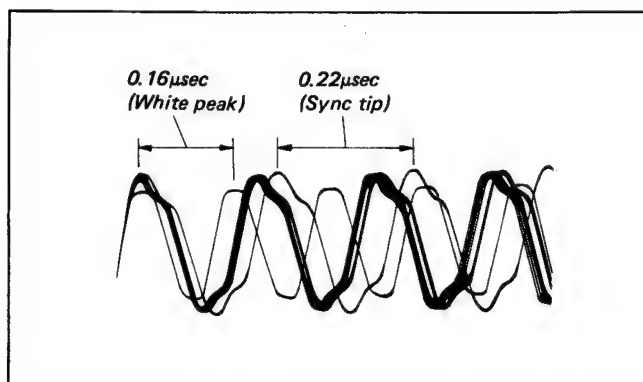


Fig. 4-7

4-1-3. Y-FM Carrier Set Adjustment

Mode: Record

Signal: None (solder bridge between TP506 and TP11 removed)

Frequency counter: TP15

[Adjustment method]

- 1) Adjust to $4.56 \pm 0.04MHz$ with RV153.

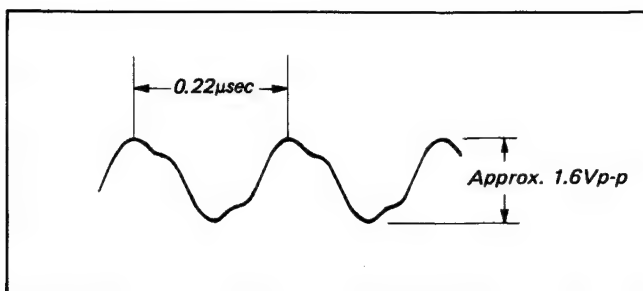


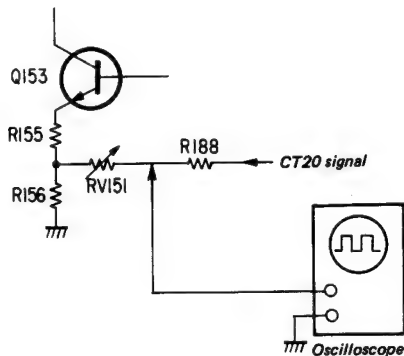
Fig. 4-8

4-1-4. 1/2fH Shift Adjustment

Mode: Record

Signal: None (solder bridge between TP506 and TP11 removed)

Oscilloscope:



[Adjustment method]

- 1) Adjust to 2.5Vp-p with RV151.

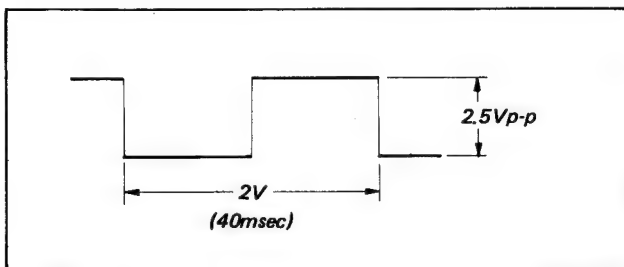


Fig. 4-9

4-1-5. Dark Clip Adjustment

Mode: Record

Signal: None (solder bridge between TP506 and TP11 removed)

Frequency counter: TP15

[Adjustment method]

- 1) Connect Q1 base to TP10 (GND).
- 2) Adjust to $2.96 \pm 0.03\text{MHz}$ with RV154.

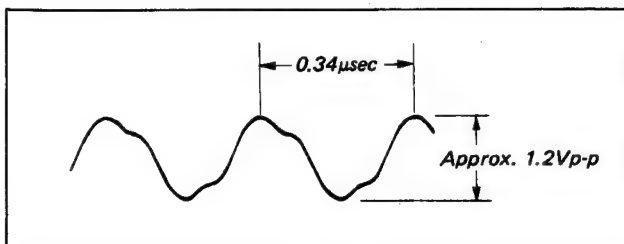


Fig. 4-10

4-1-6. White Clip Adjustment

Mode: Record

Signal: None (solder bridge between TP506 and TP11 removed)

Frequency counter: TP15

[Adjustment method]

- 1) Connect the base of Q1 to TP8 (+9V) with a $1.5\text{k}\Omega$ resistor.
- 2) Adjust to $8.13 \pm 0.03\text{MHz}$ with RV155.

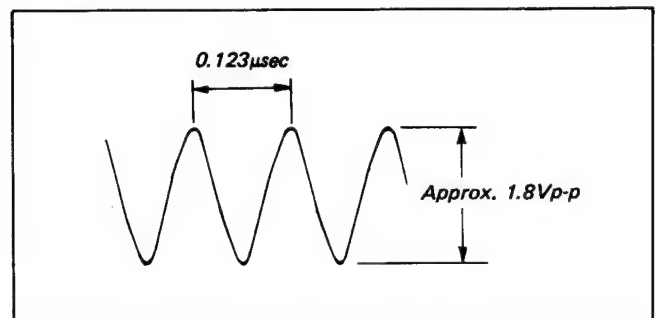


Fig. 4-11

4-1-7. Y-FM Record Current Adjustment

Mode: Record

Signal: None (solder bridge between TP506 and TP11 removed)

Oscilloscope: TP15

[Adjustment method]

- 1) Adjust to $1.24 \pm 0.04\text{Vp-p}$ with RV7.

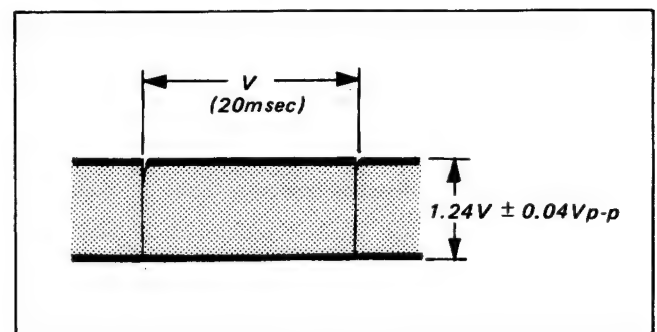


Fig. 4-12

4-1-8. Clog Detection Adjustment

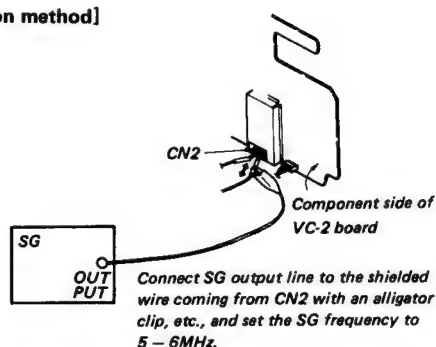
1. Adjustment of playback frequency characteristics

Mode: Playback (short pins ② and ④ of CN307 on SS-17 board)

Signal: Connect signal generator (SG) as shown below.

Oscilloscope: TP13

[Connection method]



[Adjustment method]

- 1) Adjust SG output level until TP13 output level is 100 - 200mVp-p.

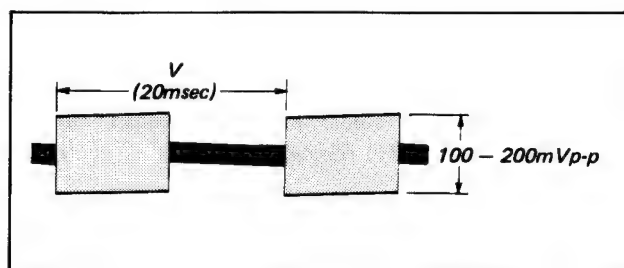


Fig. 4-13

- 2) With the SG frequency set to 5.06MHz, adjust L7 until the output level is a maximum.
- 3) Then, with the SG frequency set to 6.24MHz, adjust L8 until the output level is a maximum.

2. Adjustment of clog detection level

Mode: Record

Signal: Black level (lens covered with black paper)

Oscilloscope: TP15

[Adjustment method]

- 1) Adjust RV7 until the output level at TP15 is 290mVp-p, and record.

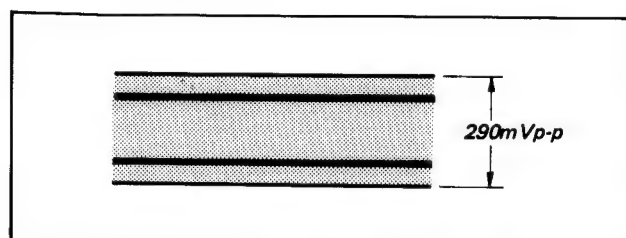


Fig. 4-14

- 2) Connect the oscilloscope to TP14.
- 3) Playback the recorded signal. (Short pins ② and ④ of CN307 on SS-17 board to get the playback mode.)
- 4) Turn RV8 fully clockwise (↻), as viewed from the pattern side, then, slowly turn it counter-clockwise (↺) until the state shown in Fig. 4-15 is attained.

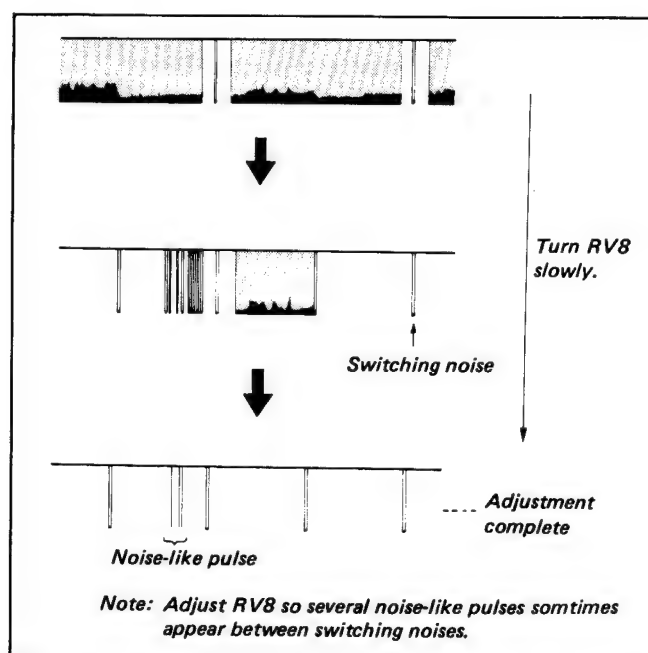


Fig. 4-15

- 5) With the recording current (TP15 output level) remaining at 290mVp-p, repeatedly press the REC START/STOP button 40 times, and make sure that the CAUTION lamp flickers each time.

Note: • Clog detection takes place when the STANDBY mode is changed over to the RECORD mode.

- To turn off the flickering CAUTION lamp, either turn off the POWER switch or eject the cassette.

- 6) Then, adjust the recording current to 460mVp-p with RV7, repeatedly press the REC START/STOP button 40 times, and make sure that the CAUTION lamp does not flicker at all.
- 7) If 5) and 6) are not satisfied, finely adjust RV8.
- 8) After the adjustment is completed, return RV7 to the original position. (Refer to 4-1-7. Y-FM Record Current Adjustment.)

4-2. SYSTEM CONTROL SYSTEM ADJUSTMENT

4-2-1. Battery Power-off Voltage Adjustment (SS-17 board)

Mode: Record

Constant voltage power supply: External power input

Digital voltmeter: J901 (JK-2 board) ⊕ terminal

[Adjustment method]

- 1) Adjust the power supply voltage until the digital voltmeter reads 9.6V dc.
- 2) Turn RV301 fully clockwise (↻).
- 3) Put into recording mode.
- 4) Adjust the power supply voltage until the digital voltmeter reads 9.0V dc.
- 5) Turn RV301 slowly counterclockwise (↺), and stop where the camera is shut off automatically.

Note: When the Betamovie is automatically shut off because of low supply power voltage, only the EJECT function will operate. To continue the adjustment, cut the power momentarily and after the voltage returns to its original value, turn on again.

[Checking method]

- 1) Adjust the power supply voltage until the digital voltmeter reads 9.6V dc.
- 2) Put into recording mode.
- 3) Slowly lower the power supply voltage, and make sure that, as the digital voltmeter reading drops to 9.10 – 9.35V dc, the CAUTION lamp flickers at 1Hz.
- 4) Further lower the power supply voltage, and make sure that the automatic shut-off operates when the digital voltmeter reading drops below 9.0 ± 0.1V dc.

4-3. SERVO SYSTEM ADJUSTMENT

4-3-1. Drum Speed Adjustment

Mode: Record

Oscilloscope: TP203 (pin ⑩ of IC201)
(or digital voltmeter)

[Adjustment method]

Adjust to $3.3 \pm 0.2V$ dc with RV202.

4-3-2. Drum Phase Adjustment

Mode: Record

Oscilloscope: CH1 TP201 (pin ④ of IC201)
CH2 TP202 (pin ⑨ of CN313)

[Adjustment method]

Adjust to $0 \pm 30\mu\text{sec}$ with RV201. (See Fig. 4-16)

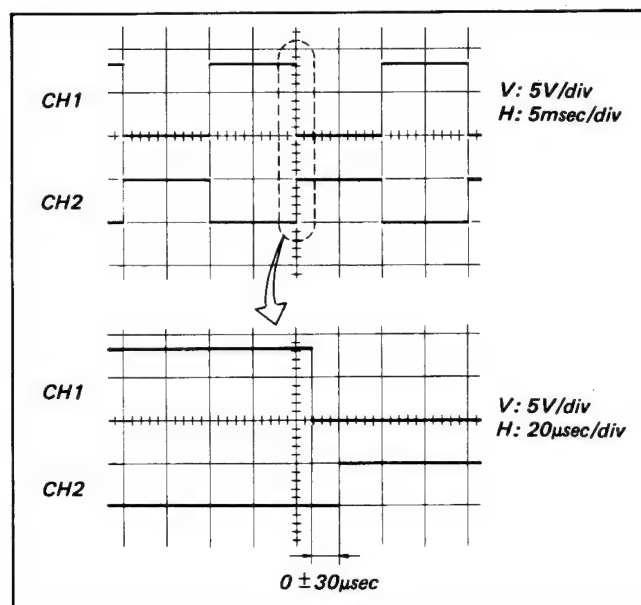


Fig. 4-16

4-3-3. Servo Lock Check

Mode: Standby

Oscilloscope: CH1 Pin ⑥ of IC201
CH2 Pin ⑦ of IC201

[Checking method]

Lock so that the waveforms of CH1 and CH2 are as shown in Fig. 4-17.

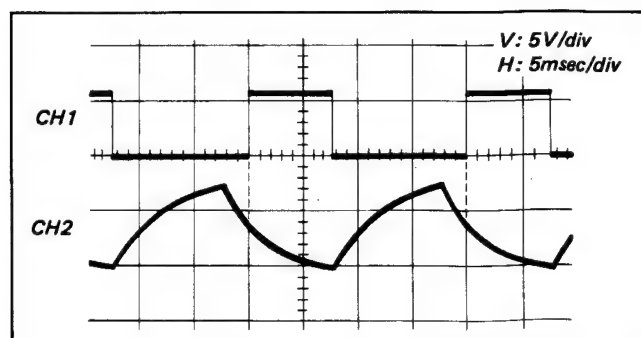


Fig. 4-17

4-3-4. Edit Adjustment

Carry out adjustments 1 through 5 given below. If adjustments 4 and 5 are not satisfied, a clear edit cannot be obtained.

1. Pinch-on delay adjustment

Mode: Standby → record
 Oscilloscope: CH1 TP301
 CH2 TP302
 Trigger CH1
 Trigger slope ⊖ (negative)
 Sweep mode NORM Adjust the trigger level until a waveform appears on the oscilloscope when changed over from standby to record mode.

[Adjustment method]

- 1) Adjust the delay time for switching from standby to record to $5 \pm 0.5\text{msec}$ with RV302.

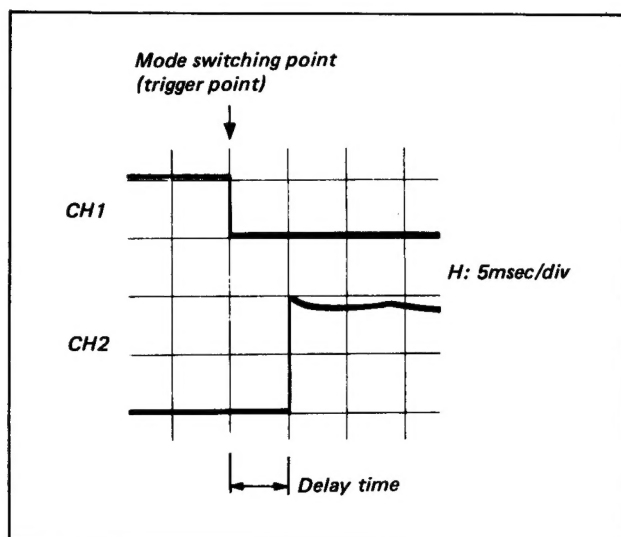


Fig. 4-18

2. Pinch-off delay adjustment

Mode: Standby ↔ record
 Oscilloscope: CH1 TP303
 CH2 TP304
 Trigger CH1
 Trigger slope ⊖ (negative)
 Sweep mode NORM Adjust the trigger level until a waveform appears on the oscilloscope when changing over between standby and record mode.

[Adjustment method]

- 1) Adjust the delay time for switching over from standby to record to $12 \pm 0.5\text{msec}$ with RV303.

2) Make " 5. Playback CTL Phase Adjustment ".

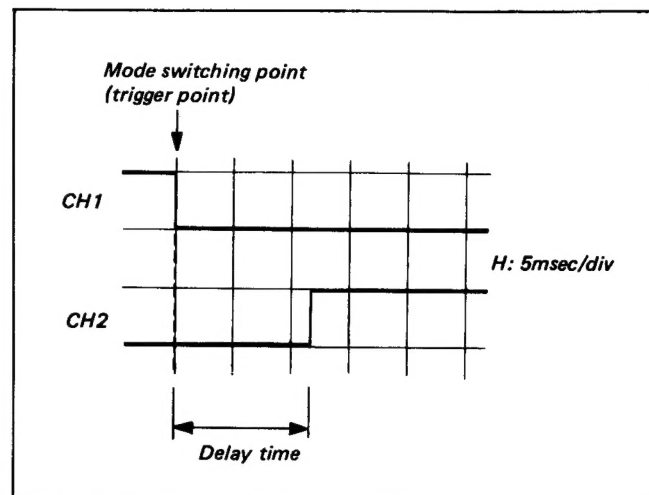


Fig. 4-19

3. Brake-on delay adjustment

Mode: Standby ↔ record
 Oscilloscope: CH1 TP307
 CH2 TP308
 Trigger CH1
 Trigger slope ⊖ (negative)
 Sweep mode NORM Adjust the trigger level until a waveform appears on the oscilloscope when switching over between standby and record.

[Adjustment method]

- 1) Adjust the delay time for switching over from standby to record to $12 \pm 0.5\text{msec}$ with RV305.
- 2) Carry out " 5. Playback CTL Phase Adjustment ".

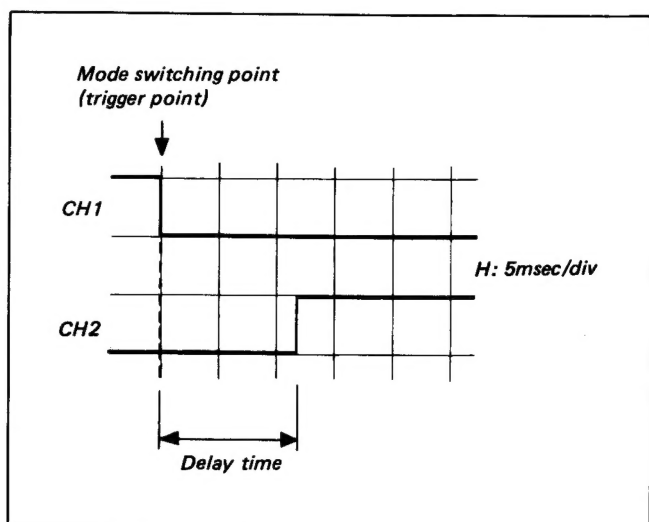


Fig. 4-20

4. Brake-off delay adjustment

Mode: Standby → record
 Oscilloscope: CH1 TP305
 CH2 TP306
 Trigger CH1
 Trigger slope \ominus (negative)
 Sweep mode NORM Adjust the trigger level until a waveform appears on the oscilloscope when switching from standby to record.

[Adjustment method]

- 1) Adjust the delay time for switching from standby to record to $17 \pm 0.5\text{msec}$ with RV304.

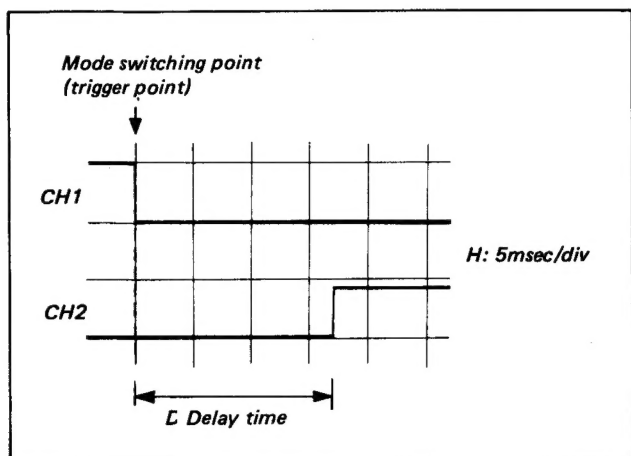


Fig. 4-21

5. Playback CTL phase adjustment

Make this adjustment accurately as inaccuracy causes noise on the edited tape.

Mode: Standby → playback
 Oscilloscope: CH1 Pin ⑩ of CN509 on VC-2 board (CT10 signal)
 CH2 TP204 on SS-17 board (CTL signal)
 Signal: Recorded tape

[Adjustment method]

- 1) When the mode is switched over from STANDBY to PLAYBACK, a solenoid actuating noise is heard three times. Check that the CTL signal position at the 3rd actuation is as shown in Fig. 4-22. The CTL signal position shifts, so switch-over between STANDBY and PB several times and take the center of the range of CTL positions for checking.

Note: The CTL signal shifts right and left because there is no playback servo. For this reason, check at the 3rd actuation.

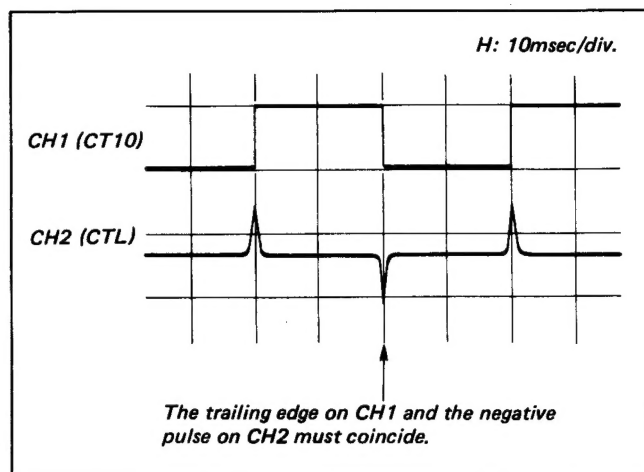


Fig. 4-22

- 2) If the pulses do not match as shown, carry out "2. Pinch-off delay adjustment" and "3. Brake-on delay adjustment" again. Ensure that the delay time for the two adjustments is equal.

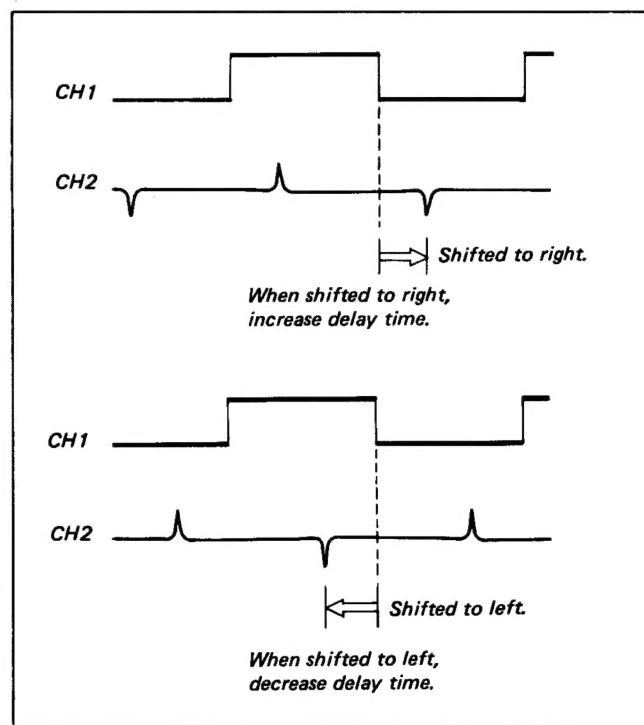


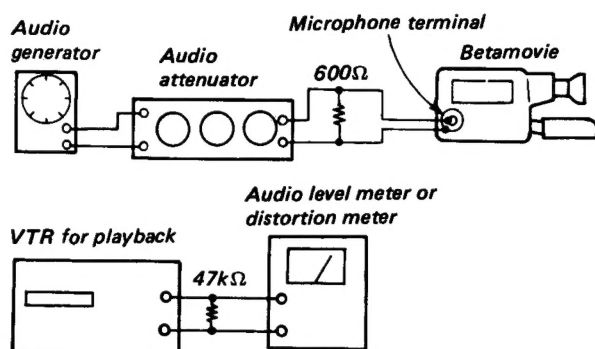
Fig. 4-23

- 3) When the delay times are not between 10 and 20msec, check "3-3-2. 7. Pinch roller position adjustment".

4.4. AUDIO SYSTEM ADJUSTMENT

To adjust the audio system, a tape recorded by the Betamovie is played back on a VTR with reliable playback characteristics.

[Connecting the equipment]



Note: The playback VTR must have had its audio head azimuth and the audio playback system (playback frequency characteristics and playback level) adjusted.

4-4-1. Audio Head Adjustment

See "MECHANICAL ADJUSTMENT".

4-4-2. Bias Oscillation Frequency Adjustment

Mode: Record

Frequency counter: Pin① of CN404

Oscilloscope: Pin① of CN404

[Adjustment method]

- 1) With the oscilloscope only connected to pin ① of CN404, read the bias signal level.
- 2) Turn RV403 fully clockwise (↻).
- 3) Connect the frequency counter to pin① of CN404.
- 4) Adjust the bias oscillation frequency to 67.7 – 70.0kHz or 60 – 64.5kHz with T401.
- 5) Disconnect the frequency counter.
- 6) Adjust the bias signal level to the level read in 1) with RV403.

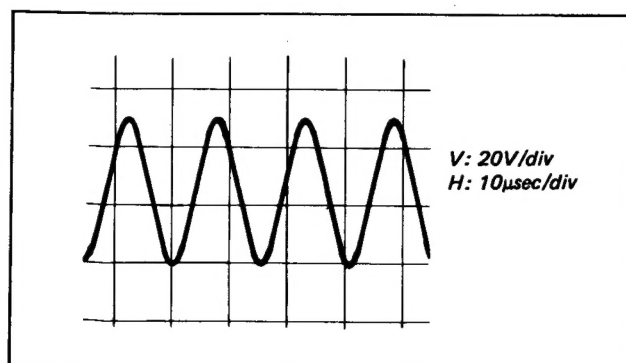


Fig. 4-24

4-4-3. Bias Leak Check (AU-3 board)

Mode: Record

Input signal: None

Oscilloscope: TP410

[Checking method]

- 1) Make sure that the bias leak is below 500mV.

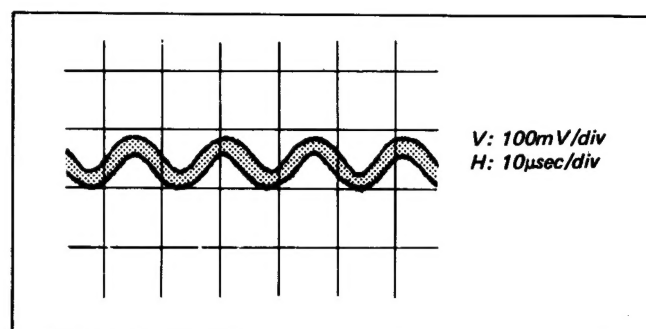


Fig. 4-25

4-4-4. Output Level Check

Mode: Record

Input signal: 333Hz, –50dB

Level meter: Earphone terminal (load impedance greater than 1kΩ)

[Checking method]

- 1) The output level at the earphone terminal must be $-4 \pm 1.5\text{dB}$.

4-4-5. Record Bias Current Adjustment (AU-4 board)

Mode: Record and playback

Input signal: 333Hz, –80dB and 7kHz, –80dB

Level meter: Audio output terminal of playback VTR

[Adjustment method]

- 1) Record 333Hz, signals at –80dB.
- 2) Record 7kHz, signals at –80dB.
- 3) Playback the recorded tape on the playback VTR, and measure the ratio of the 7kHz output level to the 333Hz output level.

Standard: The 7kHz output level should be $0 \pm 1\text{dB}$ relative to the 333Hz output level.

- 4) If the standard requirement is not met, turn RV403 as below, and repeat adjustments 1) through 3).

7kHz output level	RV403 adjustment
Low	Clockwise (↻)
High	Counterclockwise (↺)

4-4-6. Recording Level Adjustment (AU-3 board)

Mode: Record and playback

Input signal: 333Hz, -50dB

Level meter recording: TP410

Level meter playback: Playback VTR audio output terminal

[Adjustment method]

- 1) Put in the recording mode, and note the TP410 signal level. (approx. -8dB)
- 2) Playback the recorded tape on the playback VTR, and check the playback output level.

Standard: -10dB*¹ or -5dB*²

- 3) If the standard is not met, adjust the TP410 signal level with RV401, to correct the error and repeat 1) and 2).

*¹ When playback VTR audio output level is -10dB.

*² When playback VTR audio output level is -5dB.

4-4-7. Distortion Check

Mode: Record and playback

Input signal: 333Hz, -50dB

Distortion meter: Audio out terminal of playback VTR

[Adjustment method]

- 1) Make a recording
- 2) Playback the recorded tape on the playback VTR, and check the distortion.

Standard: 4% maximum

4-4-8. S/N Ratio Check

Mode: Record and playback

Input signal: 333Hz, -50dB and no signal

Level meter: Audio out terminal of playback VTR

[Adjustment method]

- 1) Record 333Hz, -50dB signals.
- 2) Record with no signal.
- 3) Playback the recorded tape on the playback VTR, and measure the ratio between the signal level (333Hz) and the noise level (no signal).

Standard: Greater than 35dB.